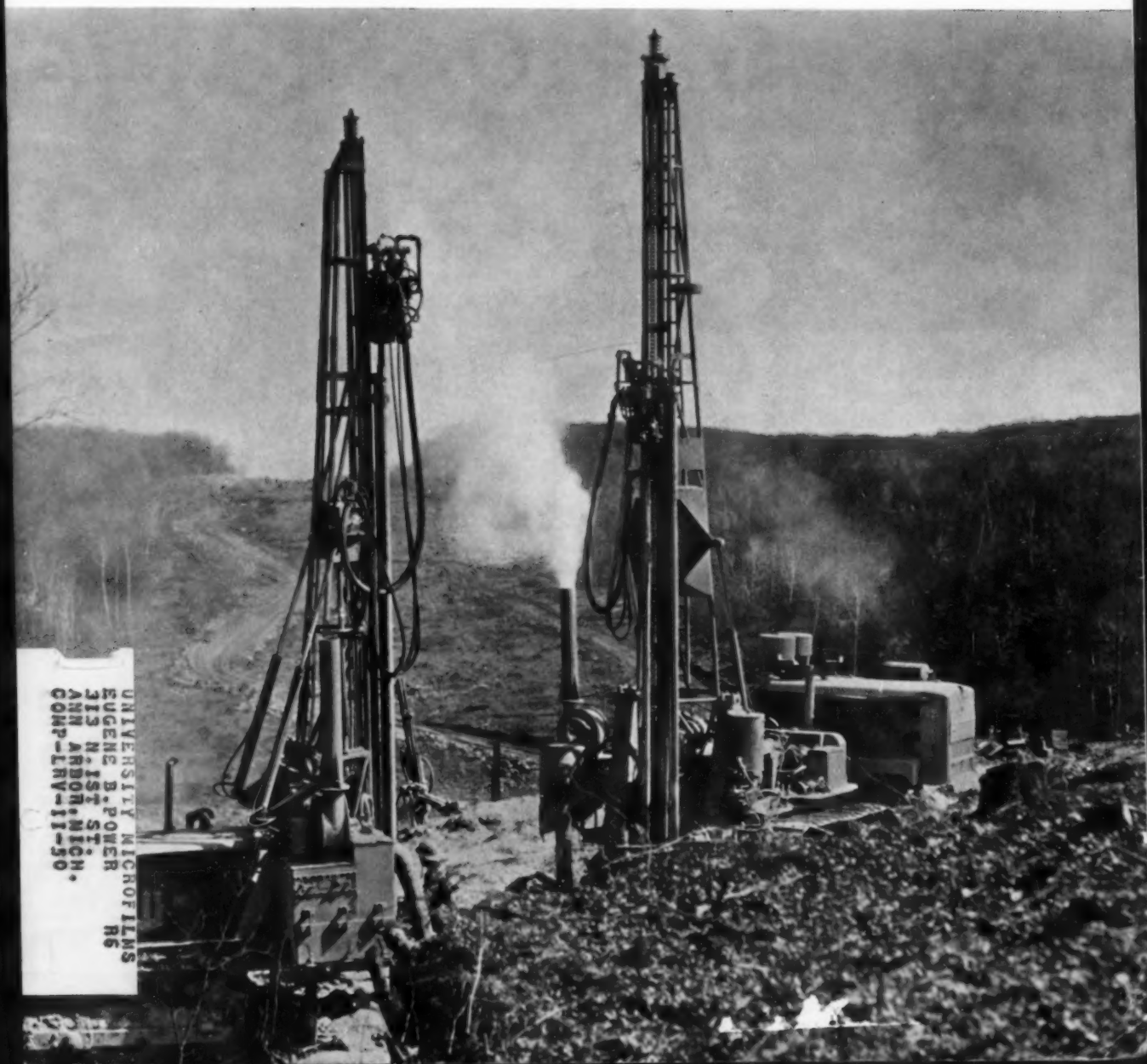
High Speed Haul Road
Bridges Arterial page 76

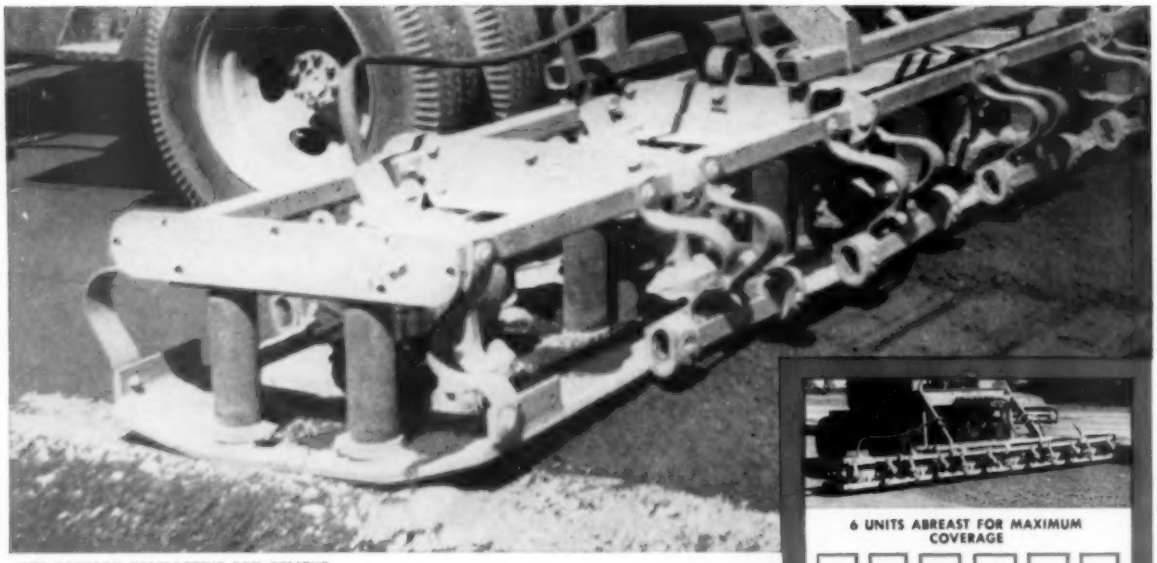
September, 1960

ROADS AND STREETS

A GILLETTE PUBLICATION



UNIVERSITY MICROFILMS
EUGENE B. POWER
313 N. 1ST. ST.
ANN ARBOR, MICH.
COMP-LAY-11-60.



THE JACKSON COMPACTING SOIL-CEMENT

104% of STANDARD DENSITY IN JUST TWO PASSES!

. . . a record that has been duplicated time and again. And the JACKSON is equally effective compacting any granular soil from sand to large rock in macadam base courses, infiltrating fines and compacting fills. With each vibratory unit delivering 4200 3-TON VIBRATORY BLOWS PER MINUTE required density is reached with unmatched rapidity. Tandem hook-ups, such as shown at the right, further decrease production time on narrow jobs. Coverage can be just what you want. Even individual units can be detached and operated like standard single compactors. And both the JACKSON MULTIPLE and the JACKSON TRAILER COMPACTOR operate in either direction . . . NO DEADHEADING OR TURNING REQUIRED.

The ball-bearing-mounted motors which actuate the compacting units operate far more efficiently than any belt or chain driven system and hence the fuel consumption of JACKSON COMPACTORS is much less than any other vibratory compactor of this type . . . troublesome parts are eliminated and daily maintenance consists only of oiling the motors.

It will pay you handsomely to get the complete facts concerning these machines before tackling any major project. See your JACKSON DISTRIBUTOR who has them for sale or rent.

JACKSON TRAILER COMPACTOR . . . may be pushed or pulled by any prime mover capable of working speeds as low as 50 FPM; towed to location at any road speed; operated in either direction; controlled by prime mover operator. Power plant supplies both single and 3-phase 110-115 volt, 60 cycle A.C. and has many uses.

6 UNITS ABREAST FOR MAXIMUM COVERAGE

6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION

5 UNITS IN TANDEM AND STAGGERED. VARIABLE FOR A WIDE RANGE OF WIDTHS.

4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.

SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.

C09

JACKSON VIBRATORS, INC.

LUDINGTON • MICHIGAN

. . . for more details circle 321 on enclosed return postal card

Long lengths and light weights cut installation time

...when you specify Beth-Cu-Loy for drainage structures

One of the chief advantages of using drainage pipe made of Beth-Cu-Loy galvanized steel sheets is the long lengths—and the light weights—that are feasible. Here's an example: a 20-ft length of 18-in. diameter pipe made of 16-ga Beth-Cu-Loy weighs but a trifle over 300 lb.

Easy to Lift . . . Easy to Make Joints

Only the simplest of lifting machinery is needed to unload and place the Beth-Cu-Loy pipe in the trench. And, of course, the long lengths reduce the number of field joints, enabling the laying crews to keep right up with the trench diggers. The joints themselves are simple and time-saving.

Steel for Strength, Durability . . . Flexibility, too

Light though it is, pipe made of Beth-Cu-Loy has the great strength of steel, and the corrosion-resistance of zinc. It is flexible enough to "give" with the fill and help distribute the load around its own periphery. It conforms well to grade and alignment, and absorbs impact, vibration, and the shifting effect of weather changes.

Beth-Cu-Loy sheets meet the rigid specs of the American Association of State Highway Officials. If you would like further details about Beth-Cu-Loy sheets for durable drainage pipe, just get in touch with any Bethlehem sales office.

Steel

For Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

. . . for more details circle 288 on enclosed return postal card

ROADS AND STREETS SEPTEMBER, 1960

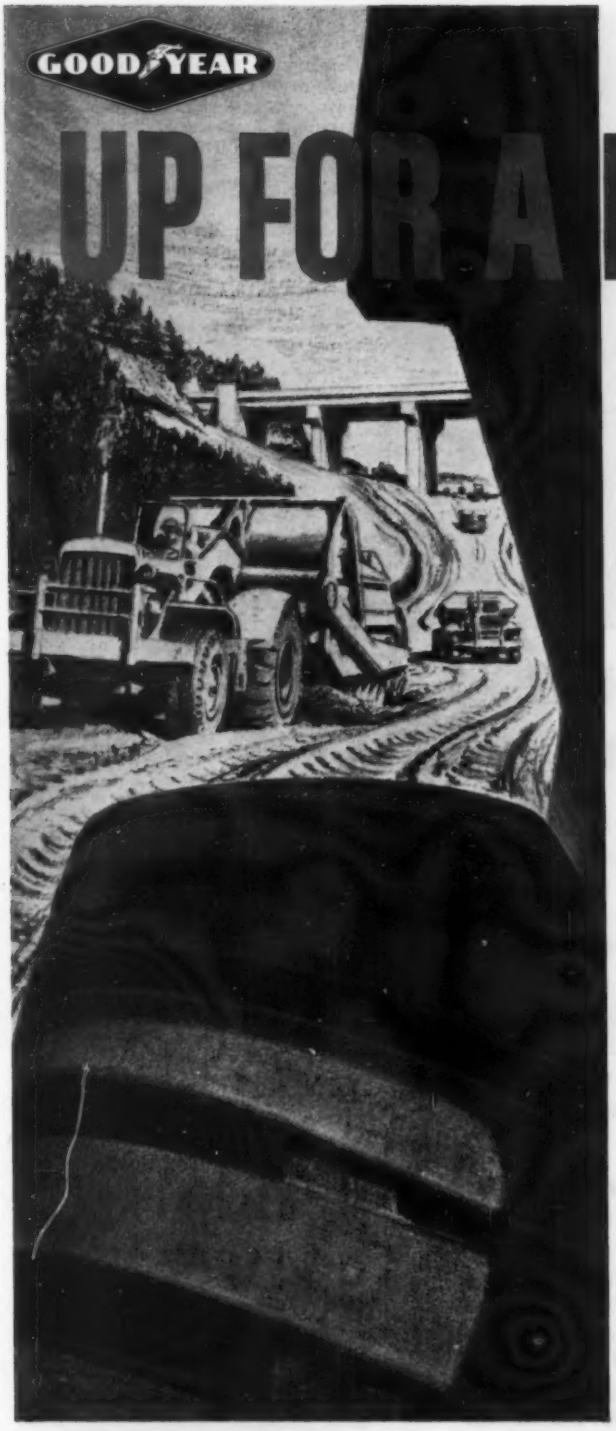
HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

Industry Affairs	19	Washington Newsletter
Contractor Management, Job Methods	72	Short Tunnel—But a Tough One
	75	Contractor's Young Cost Accountant Asks Pointed Questions
	76	High Speed Haul Road Bridges Busy Arterial
	97	Winter Deck Job Cured with Resistance Wires
	108	Base Stabilization for Desert Runway Job
	115	In Place Blending Helps Get 100% Density
	128	Special Screed Handled Deck Job
	130	Careful Blasting Removes Old Lift Bridge
	168	Planning Made 101-Ft. Steel Hauls Easier
	170	Safer, Quieter: Pile Holes Bored in Built-Up Areas
	174	Connectors Spark Scaffold Job
	176	A Project Supervisor's Responsibility to His Boss
Equipment Selection, Utilization, Upkeep	83	How Many Scrapers Per Push Tractor?
	86	Earthmoving Tire Tips
	107	Special Truck Services Gradalls
Engineering, Technical, Maintenance, Other	56	Wise Use Seen for New A36 Steel
	92	Two-Tone Channeling Solution
	120	Illinois Steps up Borings for Bridge and Fill Sites
	134	New Cross-Sectioning Method Beats Planimeter
	137	Center and Edge Strips Painted in Single Run
	150	Mobile Testing Lab for North Dakota
	152	Some Factors That Affect Quality of Bituminous Construction
	160	End Result Rolling Produced Best Mat Densities
Departments	29	People
	39	New Publications
	44	Job Safety
	50	Job Ideas
	71	Editorial (Contractors and Cost Keeping)
	94	Court Decisions
	119	Traffic Safety
	142	Maintaining Your Equipment
	163	Views and Comments, by H. G. Nevitt
	165	Labor Law
Where To Buy It	163	Reader Inquiry Card
	178	New Products
	191	Manufacturers' Literature
	208	With the Manufacturers and Distributors
	195	Clearing House (Used Equipment Advertising)
	210	Advertisers' Index

FRONT COVER SCENE

Pair of Ingersoll-Rand Quarrymaster drills on project of Savin Brothers, Inc., Connecticut Route 8. Feature report published in June issue.

Accepted as Controlled Circulation Publication at Milwaukee, Wisconsin. Published monthly. Subscription $6.00 per year ($7.00 foreign.) Form 3579 requested to be returned to Gillette Publishing Company 22 W. Maple St., Chicago.



UP FOR A BIG BID?

Let Goodyear keep your tire costs down

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists are prepared to analyze your tire needs with an eye to keeping costs under control. These specialists will check the terrain, loads, climate, roads, schedules and speed problems that confront you, and can select the right Goodyear tires to help you solve them.

PUTTING BIG-TIRE KNOW-HOW TO WORK—From the world's greatest wealth of experience, Goodyear Big-Tire Specialists are uniquely qualified to help you. And they'll provide the best in tread and body designs to help safeguard your contract and your profits.

SETTING UP BIG-TIRE SERVICE—You say the word, and Goodyear Big-Tire Specialists will set up a tire-maintenance program at the jobsite to help save you man-hours, machine-hours and useful tire life. In addition, Goodyear Contractor Service *will travel* with your job—handle all your tire maintenance and repair needs.

With BIG-TIRE PERFORMANCE Example: SUPER HARD ROCK LUG

Here's one of Goodyear's Big Tires for the Big Bid you have coming up. It's the SUPER HARD ROCK LUG, built for heavy loads and no roads to make the going easy. Triple-tough 3-T Nylon Cord for the greatest tire stamina, plus new, special cut-shrugging rubber compounds, make this tire a real cost-saver in the roughest off-highway service.

For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

Lots of good things come from

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

. . . for more details circle 309 on enclosed return postal card

JS-30'S SHIFTING WHEEL LICKS SNUG TRENCH JOB

THE CLEVELAND JS-30 TRENCHER, with instant lateral shifting and power tilting of its digging wheel, got high daily trench production on a utility job where trench had to be dug in a road shoulder hemmed in by poles, trees and heavy growth on side slopes rising sharply within six feet of the pavement's edge.

Crawlers were steered as necessary to sneak by obstructions, while the JS-30's digging wheel was power-shifted laterally, keeping trench digging right on line. Power-tilting of its digging wheel allowed the JS-30 to dig straight vertical trench with one track higher than the other on the side slopes, without blocking or cribbing.

THE JS-30—A TRENCHER OF AMAZING UTILITY

- Digging wheel power-shifts 5' from side to side
- Digs trench flush with parallel pavement, curbs, etc.
- Digs trench virtually flush with trees, poles, fences, etc.
- Digs vertical trench on side slopes, cuts blocking, cribbing
- Excavates bell holes, saves on trench width
- Digs 11"-24" wide, to 5½' deep; digs to 6' wide with power-shifting of wheel
- 100% control of all operations at operator seat.

Get the complete story on the JS-30 from your distributor

The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

Good Everywhere

. . . for more details circle 297 on enclosed return postal card

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 68 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

HAROLD J. MCKEEVER, *Editor-in-Chief*
CHARLES T. MURRAY, *Managing Editor*
JAMES R. CUMMINGS, *Associate Editor*
DUANE L. CRONK, *Washington Editor*
DOUGLAS MCDONOUGH, *Assistant Editor*
HELENA JUNG, *Production Editor*
BERNARD A. WEDELL, *Products Editor*
GEORGIA ZOGRAFOS, *Editorial Secretary*
H. K. GLIDDEN, H. G. NEVITT, R. L. PEURIFOY, *Contributing Editors*

BPA

GILLETTE PUBLISHING COMPANY

Publication and Editorial Offices: 22 West Maple Street, Chicago 10, Ill.

HALBERT P. GILLETTE, Founder and President, (1869-1958)
W. E. GILLETTE, President and Publisher
HALBERT S. GILLETTE, Vice President and Assistant Publisher

Chicago Office: 22 West Maple St. Superior 7-1581. R. T. Wilson, Gen. Sales Manager; Fred H. Bowes, Representative; E. Bender, Clearing House Manager; J. L. Latta, Production Manager; L. R. Vickers, Circulation Manager; A. W. Lehmann, Research Director.

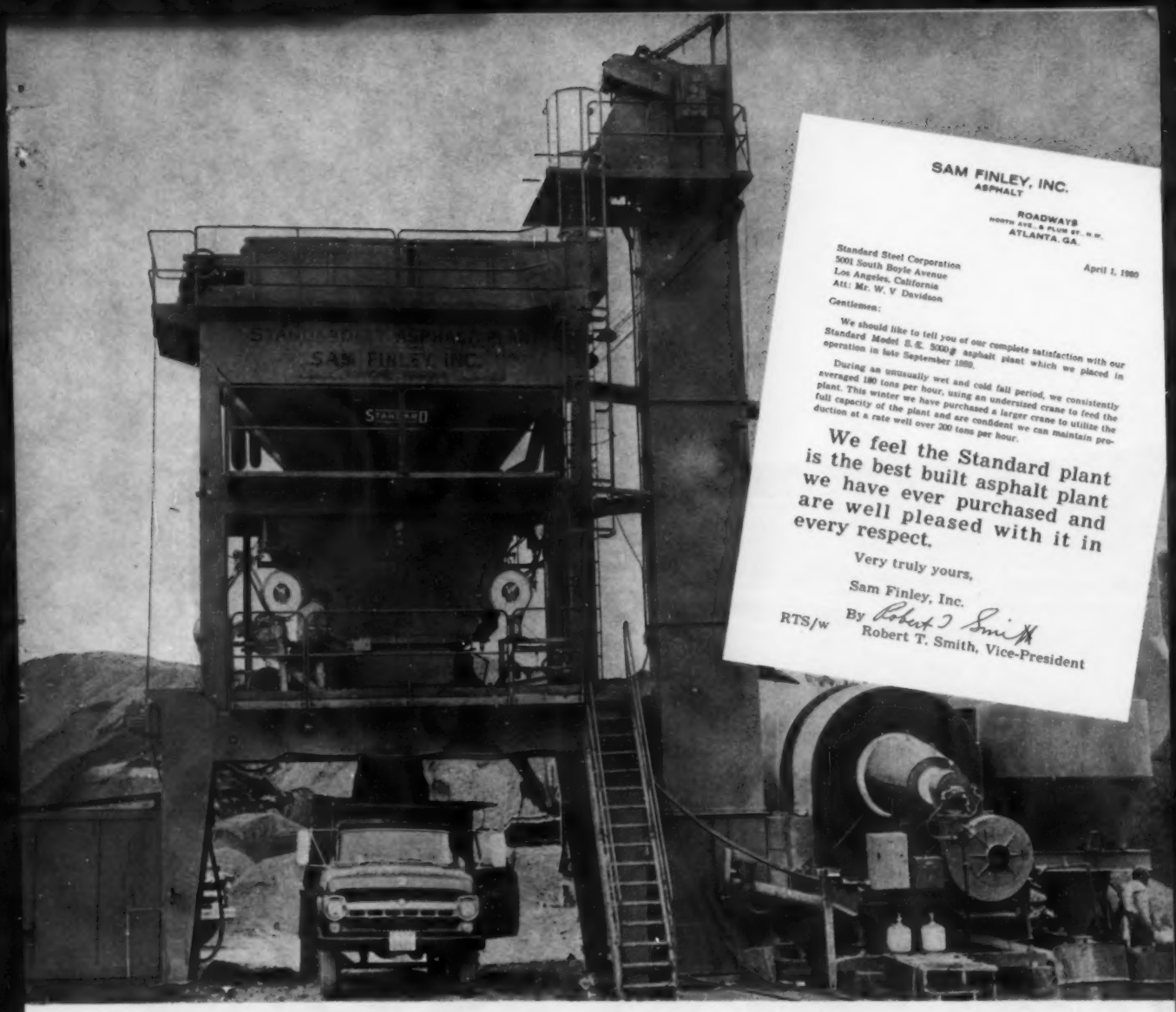
New York Office: 15 E. 40th St., New York 16, N. Y., Oregon 9-7750. F. A. Michel Jr., Eastern Manager.

Cleveland Office: Trace Building, 3100 Wooster Rd., Cleveland 16, Ohio, Edison 1-2267, Ray Keine, Manager.

West Coast Office: 1126 Del Rey, Pasadena, Calif., Sycamore 4-6328, J. A. Osborne, Manager.

OTHER GILLETTE PUBLICATIONS

Rural Roads • Street Engineering
World Construction • Caminos y Construcción Pesada


SAM FINLEY, INC.
ASPHALT
ROADWAYS
ATLANTA, GA.
Standard Steel Corporation
5001 South Boyle Avenue
Los Angeles, California
Att: Mr. W. V Davidson
April 1, 1960
Gentlemen:
We should like to tell you of our complete satisfaction with our Standard Model S. E. 5000 asphalt plant which we placed in operation in late September 1959.
During an unusually wet and cold fall period, we consistently averaged 180 tons per hour, using an undersized crane to feed the plant. This winter we have purchased a larger crane to utilize the full capacity of the plant and are confident we can maintain production at a rate well over 200 tons per hour.
We feel the Standard plant is the best built asphalt plant we have ever purchased and are well pleased with it in every respect.
Very truly yours,
Sam Finley, Inc.
By Robert T. Smith
RTS/w
Robert T. Smith, Vice-President

SAM FINLEY, INC. says:

"BEST ASPHALT PLANT WE HAVE EVER PURCHASED"

This revolutionary new STANDARD Model S-E 5000 pound self-erecting, self-contained fully portable Asphalt Plant can be wheeled to the job-site, completely set up *without the use of a crane*, and producing hot mix within 48 hours! Manufactured in 4000, 5000, and 6000 pound batch capacities.

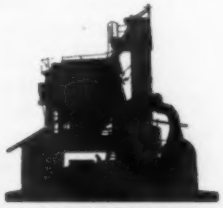
PUSH BUTTON ERECTION — Entire mixing unit is *automatically* raised into operating position.

STANDARD
ASPHALT PLANTS

STANDARD / Complete line of Asphalt Plants 2000 through 8000 pound capacity.

Model T-M • Trailer-mounted, self-contained.

Model R-M • Semi-portable and stationary



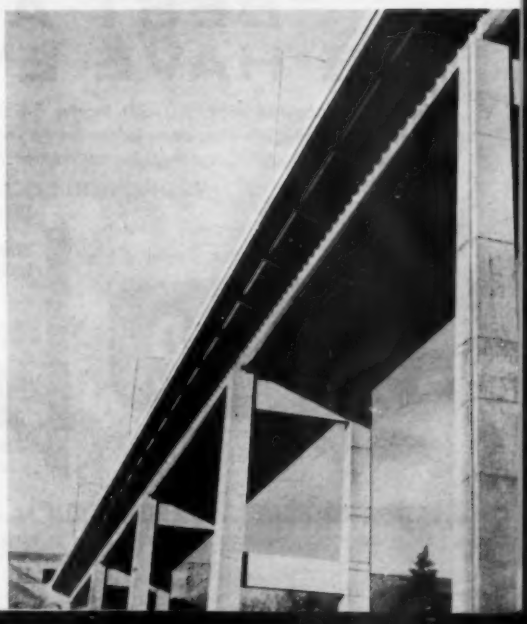
Model S-E • Self-erecting, fully portable.

STANDARD STEEL CORPORATION *Manufacturers of: Asphalt Plants • Rotary Dryers • Kilns • Coolers • Cryogenics*

GEN. OFFICES AND PLANT: 5003 BOYLE AVE., LOS ANGELES 58, CALIF. • MIDWEST OFFICES AND PLANT: DECATUR 3, ILL. • EASTERN OFFICES AND PLANT: LOWELL 3, MASS.

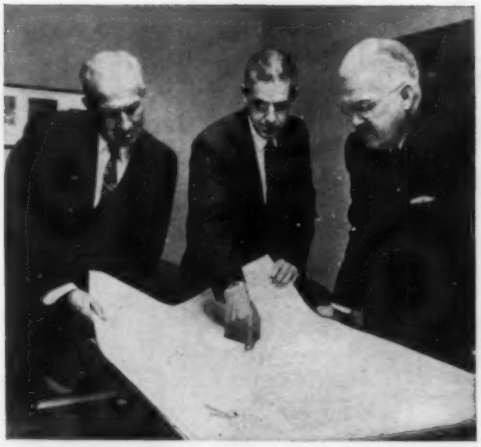
. . . for more details circle 341 on enclosed return postal card

New Maple Street Bridge, Spokane, Washington, designed in steel for economy and fast erection.



Underside of Maple Street Bridge showing built-up steel members. Steel can be readily welded, flame-cut, riveted or bolted.

This mark tells you a product is made of modern, dependable Steel.



Admiral Carl A. Trexel, Vice-President, Leslie A. Helgesson, Vice-President, and Ralph A. Tudor, President, discussing plans for a steel bridge.

Steel specified in 80% of bridge work

at Tudor Engineering Company, Consulting Engineers, San Francisco

Some of the recent outstanding bridges this firm has designed include the Dalles and Umatilla Bridges across the Columbia River in Oregon; the Maple Street Toll Bridge over the Spokane River at Spokane, Washington; and another toll bridge which spans the Port Washington Narrows at Bremerton, Washington.

Of these, the Maple Street Bridge is the most outstanding example of the use of structural steel in short-span bridge design to gain the advantages of economy and rapid construction. The bridge is 1,713 feet long and is built of steel with four 150-foot spans, two 125-foot sections and five 100-foot sections. It supports four roadways.

Steel reduces costs. According to Mr. Ralph A. Tudor, President of Tudor Engineering Company, steel construction offered a great advantage for this bridge because a crew could swing a section into place, bolt it to the supports, and then move ahead to the next section. No falsework was involved, the erection was fast, clean and safe, and the design was the most economical solution.

Steel saves design time. Steel is a familiar material and there are no unknown factors. This is important because the designer is looking for reliable performance. The new electronic calculators can be used to work out mathematical problems quickly in steel bridge design.

Steel permits increased headroom. New highway regulations are calling for increased headroom and this can be obtained most economically with steel. Bridges can be designed with higher strength steel, such as USS MAN-TEN, TRI-TEN or "T-1" brands, that add valuable inches of clearance with less weight and reduced foundation costs.

Steel production facilities increased. The steel industry has greatly expanded its facilities for manufacture of structural shapes and plates. You can confidently design in steel—the material you know best, and the material that offers most —knowing it will be available.

USS, MAN-TEN, TRI-TEN and "T-1" are registered trademarks

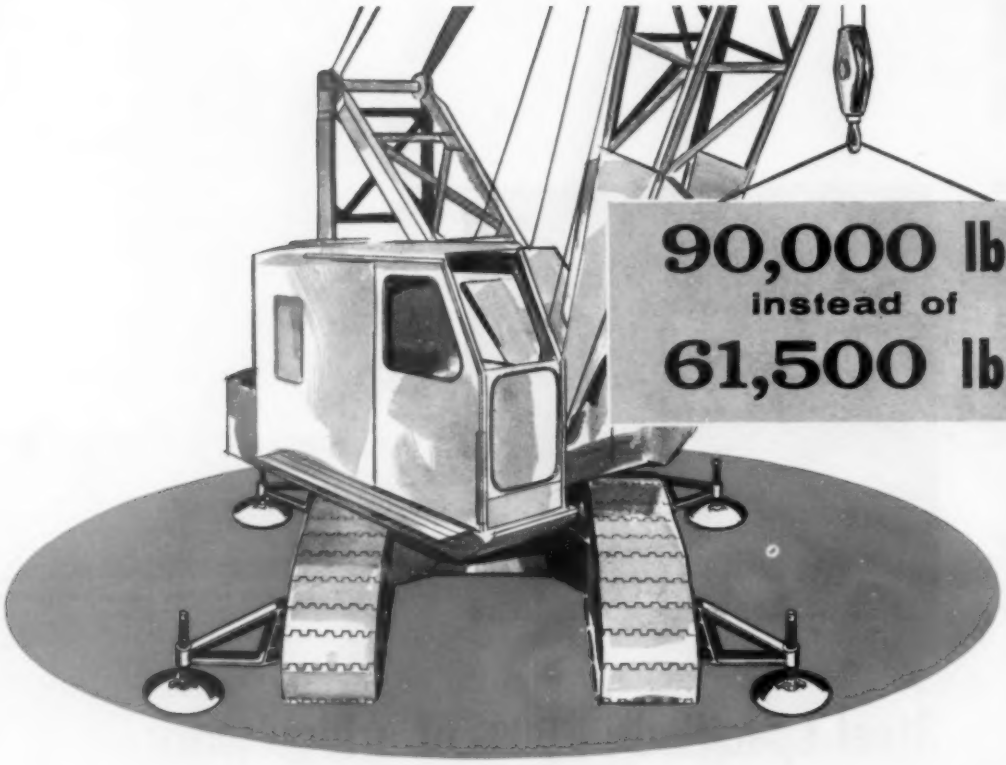
USS Steels for Bridge Design

Structural Carbon Steel 33,000 psi minimum yield point	**USS MAN-TEN High Strength Steel** 50,000 psi minimum yield point
USS TRI-TEN High Strength Steel 50,000 psi minimum yield point	**USS "T-1" Constructional Alloy Steel** 100,000 psi minimum yield strength

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

. . . for more details circle 347 on enclosed return postal card

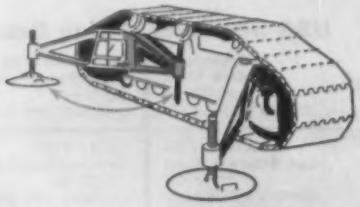


SOLID FOOTING: 46% MORE LIFT

"Sprawler" easily outlifts all crawler cranes of comparable size

"Sprawler" plants four big feet for bonus lift, better leverage

Weight lifter uses wide stance for better leverage, more stability.



Outriggers work on same principle, give better stability than counterweight alone. Increase your lift capacity from 61,500-lb to 90,000-lb.

Watch a weight lifter and you'll see the secret of the 545 Sprawler's bonus lifting capacity. Feet are spread and firmly planted to provide greater leverage . . . more stability under load.

Sprawler's pivoting outriggers provide a big, square, firm foundation . . . increase lifting capacity 46%. They are an integral part of the rugged, one-piece carbody, resist torsional strains at every working angle.

When crawling, outriggers tuck in close to crawler frame. And it takes only a few minutes to swing them out and pop on the pedestals to increase your lifting capacity. The 545 handles up to 150 feet of boom and jib.

545 Sprawler MAXIMUM LIFT CAPACITY WITH OUTRIGGERS IN PLACE: 90,000-lb	545 Sprawler MAXIMUM LIFT CAPACITY WITH PEDESTALS RAISED FOR WALKING: 61,500-lb

There's a Model 330 Sprawler, too! Lift bonus is 69%. The 330 will walk loads up to 35,450-lb, but with outriggers in place will lift 60,000-lb. See your distributor for details. K29

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

. . . for more details circle 324 on enclosed return postal card

UP And RUNNING In 16 Hours..

Automaster-CA Paving Plant

Here's a one-stop paving plant that starts batching profit in as little as 16 hours after components arrive. All parts of the plant package are pre-assembled into easy handling, compact units that meet road limits for truck transport. Maximum lift is about 7½ tons.

What About Batching?

The Automaster-CA weighs out a 1½-cu. yd. paver batch every 15 seconds! Plant has three 38 cu. ft. (3000-lb. scale) aggregate batchers, one 14 cu. ft. (1000-lb. scale) cement batcher. All are air-ram operated, fully automatic — have centralized controls, electric interlocks, and beam boxes with balance indicators.

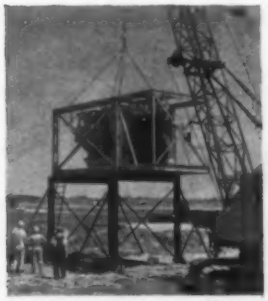
To meet U. S. Engineer specifications, batching equipment can be furnished with dial scales, 12-mix selector system, graphic pen recording, time and date stamp, interlocks, and aggregate moisture compensating beams. Ask your Johnson distributor for details.

C. S. JOHNSON COMPANY
CHAMPAIGN, ILL., STOCKTON, CALIF.

A Division of **KOEHRING** *Company*

See your distributor about the Koehring Equipment Show, Waukesha, Wisconsin . . . . Week of September 19th 37

... portable, stack-up design speeds assembly



Batchers, dial scales and control console are combined into one compact unit — install in one lift. Plug-in control connections eliminate complex field wiring.

Divided material bin stacks above batchers. Holds 100 cu. yds. aggregate (150 tons @ 3000 lbs. per yd.) — 145 bbls. cement (@ 4 cu. ft. per bbl.)

Next, cement elevator complete with head platform, access ladder, and safety cage goes up. Chain and bucket-line capacity: 440-bbl.-per-hour.

Lower undertrack screw conveyor into place, add silo, and bring on the trucks! Silo with aeration system, high-low-level signals, etc. Holds 447 bbl.

. . . for more details circle 325 on enclosed return postal card

LUBE LOGIC

Five tips to

Texaco "lay-away plan" protects exterior of idle equipment

Equipment that won't be needed for a while is sometimes simply parked somewhere so nobody will fall over it. Well and good, but not enough—because rust and corrosion account for almost half of what you spend on equipment maintenance. Here's a 6-step program that will keep idle equipment in cracker jack shape no matter how long it's out of use, or where it's stored. The basic ingredient is Texaco Rustproof Compound L—a remarkable product that keeps rust from starting, and acts to loosen rust that's already on the equipment.

Before applying Texaco Rustproof Compound L, make sure all exterior surfaces are clean and fairly dry.

Coat all adjustment bolts and other exposed threads with Rustproof Compound to facilitate removal or adjustment.

At temperatures of 65° or more, Texaco Rustproof Compound L can be applied to smooth accessible surfaces by brushing.

At temperatures below 65°F, or for inaccessible and complicated areas, spraying is the best way. You can thin the Rustproof Compound to a sprayable consistency by adding naphtha to form a 10 to 50% solution. Add the naphtha slowly to the compound and stir vigorously so the whole batch is the same consistency.

Apply tags at conspicuous points on the equipment describing the rustproofing measures that have been taken.

Thoroughly lubricate all equipment before storage.

Starting up equipment after storage

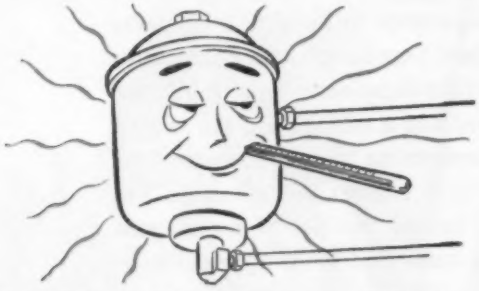
In most cases it's not necessary to remove Texaco Rustproof Compound L. You should, however, remove it from surfaces that will come into contact with personnel (such as ladders, seats and handles) and from surfaces that are heated to high temperatures when the equipment is operated.

Since Texaco Rustproof Compound L is *not* a lubricant, all working surfaces and lubrication fittings should be wiped clean before use, and the correct lubricant should be applied before starting up.

Thicker oil won't stop gear-case drooling

You can't fix leaking seals on a gear-case simply by switching to a heavier-grade gear lubricant, because in gear cases carrying heavy loads, the thicker oil simply increases gear-case temperature, which thins out the oil and it starts leaking again. Sometimes, however, foaming and leaking of gear-case lubricant indicates that the oil level is too high. By keeping vents open and keeping the oil at the recommended level, you prevent build-up of pressure which would cause leakage.

trim maintenance costs



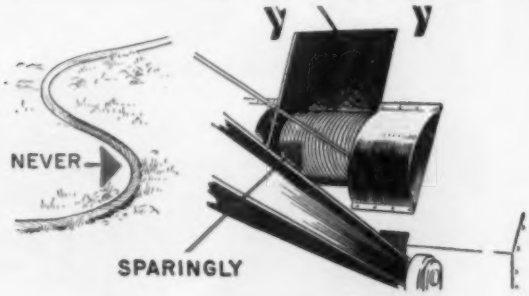
A filter that's working runs a temperature

Oil filters last so long these days it's sometimes hard to say when they were last changed. But they're so important to engine performance that it's essential that you know whether they're too full to filter right. Here's a simple way to find out.

A filter that's working will be as warm as the engine oil. If the filter on a fully warmed-up engine remains cool to the touch, it's a safe bet that it's too clogged up to let any oil through. Just to double-check, tap the filter case sharply. A metallic ringing sound means the cartridge is still in good shape. A soggy thud often means that the filter is loaded. Top mileage for even the best filter is 6,000 miles, never more.

Crawler treads are happier dry

There are few places where good lubrication is more important than in track-roll bearings, but make sure you don't lubricate the crawler treads themselves in a burst of enthusiasm. The pins that connect the links of crawler treads are designed to operate without lubrication, because dirt or other abrasives would act as a lapping compound in service. Result: much shorter service life for the track. Moral: if you don't want to lap your crawler link pins, don't oil them.



How often should you lubricate wire rope?

How much lubrication is good for wire rope and cable depends mainly on how it's used. Cables that are dragged in dirt shouldn't be lubricated at all. Oil simply holds the dirt where it can work into the strands and cause rapid wear. Cables that are wound on drums equipped with clutches should be lubricated sparingly to prevent fouling the clutch faces with lubricant. With other wire ropes, apply Texaco Crater A every 10 to 100 hours as necessary to avoid dryness. Be sure to clean the rope before adding new lubricant.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

. . . for more details circle 344 on enclosed return postal card

If you use rear-dump haulers

Backed by better than 25 years of specialized experience in building off-highway earthmoving equipment exclusively, Euclid's modern rear-dump line incorporates advanced engineering that is a result of unmatched field experience. From the 10-ton Model R-10 to the big 55-ton "Euc" with two engines and a total of 672 h.p., Euclid Rear-Dumps are job proved to meet today's requirements for big performance. This greater dimension... in range of capacities, in choice of engines, transmissions and tire sizes, and in type of hauler... and in parts and service facilities of a world-wide dealer organization, too... can mean lower hauling costs and more work-ability on every one of your rear-dump jobs.

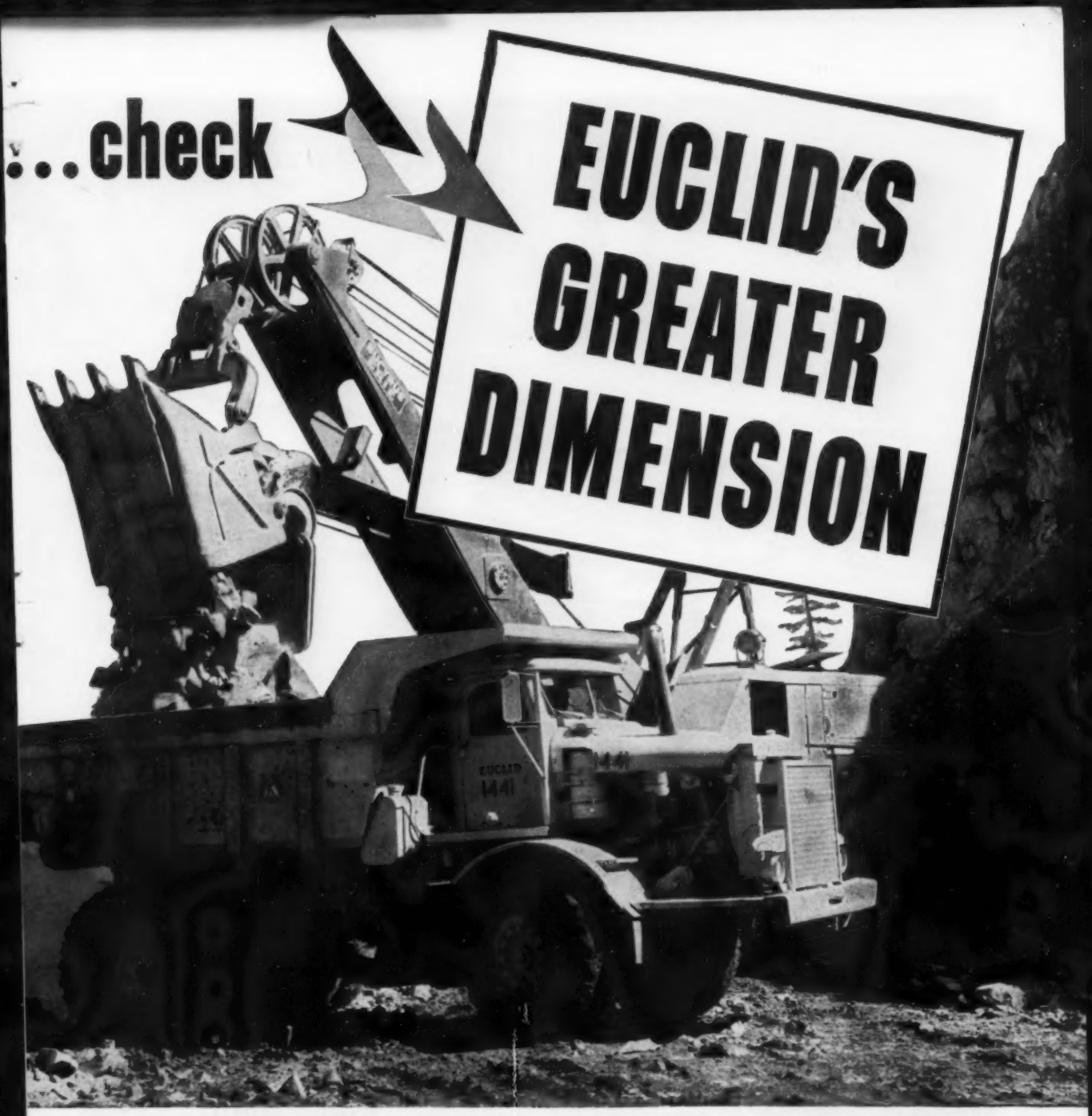
Have the Euclid dealer in your area give you facts and figures to compare with your own hauling costs... you'll find Euclid's greater dimension pays off in a better return on your investment. EUCLID Division of General Motors • Cleveland 17, Ohio

Payload capacities of 10, 15, 18, 22, 27, 40 and 55 tons... also semi-trailer models of 12, 22, 35 and 50 ton capacity.

When you compare Rear-Dump Haulers, check these 7 points...

- is maker experienced in the field... known for building a dependable, well-engineered product?
- does machine have required performance ability needed... capacity and speed for high production work, power and traction for rough going and steep grades?
- well-balanced for size of loading equipment... hoppers and controlled dumping needs?
- is there good parts and service availability... at both manufacturer and dealer level?
- are maintenance manuals, parts books and service literature complete... is machine designed for easy servicing?
- is machine easy to operate... convenient controls... good visibility... operator comfortable so that efficiency is maintained for entire shift?
- can required production be maintained at low cost... construction rugged enough to withstand heavy service with minimum maintenance?

Euclid Rear-Dumps meet every one of these important requirements... and more!



BIG POWER . . . BIG CAPACITY . . . BIG PERFORMANCE

Model R-27 has heaped capacity of 26½ yds. . . . rated payload is 54,000 lbs. . . . available with Cummins 335 h.p. or GM 336 h.p. engine . . . 4-speed Torqmatic Drive with converter lock-up and Torqmatic Brake . . . dual hydraulic booster steering . . . 18.00 x 25 tires on all wheels . . . rugged body with twin hoists . . . top speed with full payload, 34 mph. . . . available in two body types, standard for all-around use and quarry for hauling big rock.

ENGINEERED FOR EASY SERVICING

Like other Euclids, the R-27 is of simple, rugged design for years of dependable performance at minimum maintenance cost. When repair or replacement of major components is necessary, service-minded engineering saves time and money, too. For example, a transmission can be removed and replaced in just one-eighth the time required for the same work on a competitive hauler of the same capacity . . . engine replacement takes only one-half as many man-hours.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Wheeling

CORRUGATED METAL CULVERT PIPE BY WHEELING

Problem: *Because outdated bridge is used regularly by heavy logging trucks, bridge requires monthly inspection, frequent maintenance*

Best way to "modernize" old bridges!

Why fight an endless battle to maintain old bridges? Especially when you can replace these "budget eaters" with low-cost Wheeling Corrugated Metal Culvert Pipe. Just look at the advantages it has!

Resistance to shock and vibration — Unlike concrete pipe, Wheeling Corrugated Culvert Pipe is flexible. So it absorbs the severe shock caused by shifting fill and heavy trucks.

Amazing strength — This same flexibility makes Wheeling Culvert Pipe far stronger, because it enables the pipe to "borrow" strength from the surrounding earth (see for yourself by conducting this simple test with your garden hose).

Won't disjoint — Wheeling Culvert Pipe adjusts to the pressures created by shifting fill because it has beam strength . . . and Wheeling Culvert Connecting Bands grip *both* pipe ends securely.

Special end treatments—Never a problem! You always get fast, economical service on special end treatments, including skews and bevels, from your nearby Wheeling Culvert Plant.

WHEELING CORRUGATING COMPANY

Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis,*

Solution: *Wheeling Large Diameter Corrugated Metal Culvert Pipe easily handles peak stream flow . . . absorbs shock created by logging trucks.*

Special finishes — For corrosive or abrasive situations, Wheeling supplies special finishes, including full and partial bituminous coatings with or without paved inverts.

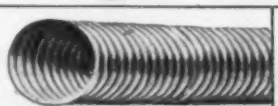
You always get fast delivery on Wheeling Culvert Pipe and Fittings because Wheeling maintains special culvert plants at Des Moines, Detroit, Kansas City, Louisville, Madison, Wis., Martins Ferry, Ohio, Minneapolis, Peoria, Ill., Philadelphia and St. Louis.

Get the whole story on Wheeling Corrugated Metal Culvert Pipe (both copper-bearing steel and copper-bearing pure iron) from your Wheeling man this week. Or write directly to Wheeling Corrugating Company, Wheeling, West Virginia.

USE WHEELING CULVERT PIPE HERE, TOO!

Where headroom is limited, use special wide-based Wheeling Pipe Arch.

For efficient roadside drainage, use Wheeling Small Diameter Culvert Pipe.



For deep, fast-flowing streams, use Wheeling Large Diameter Culvert Pipe.

For deep, shifting fill, use Wheeling Large or Small Diameter Culvert Pipe.

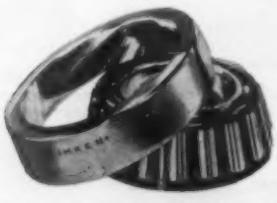
IT'S WHEELING STEEL!

New Orleans, New York, Philadelphia, Richmond, St. Louis. Sales Offices: *Atlanta, Houston.*

. . . for more details circle 352 on enclosed return postal card

THERE are two big reasons why the trade-mark "Timken" guarantees top bearing value. 1) It assures you of uniform high quality and performance. From the steel right through to final inspection, Timken® bearings are made to the industry's most exacting specifications. 2) You're assured of the finest bearing service available.

"Timken" is the registered trade-mark that identifies tapered roller bearings, fine alloy steel and removable rock bits made by The Timken Roller Bearing Company. For your guarantee of value, specify "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Canadian Division: Canadian Timken, St. Thomas, Ontario.



Industry rolls on

TIMKEN®

tapered roller bearings

. . . for more details circle 346 on enclosed return postal card

ROADS AND STREETS
Sixty-Eight years of Editorial Leadership

Washington News Letter

By Duane L. Cronk, Director, Highway Information Services, Inc.

September 10, 1960

The Bureau of Public Roads is trying to sit on the new revised estimates for the cost of completing the National Interstate System - without much success. The news is too good to keep apparently - namely that the new estimate is running slightly lower than the 1958 figure. (Not all the states are in yet.) The agency wants Congress, which requested the study, to see the results first, but some states have already released their new estimates and others haven't tried very hard to suppress them.

Virginia made the headlines with the announcement that its new estimate is a spanking 20% lower than in 1958, even with greater mileage involved. The Commonwealth highway officials attribute a $316 million reduction in their figures to:

Larger contracts with consequent lower unit prices for construction.

Design and construction experience.

A general "tightening up" of design standards.

Elimination of some work, including interchanges.

* * *

The BPR has formally reported findings of irregularities in right of way acquisition in Massachusetts to the Blatnik Committee. The discovery touched off quite a political hassle among members. The Republicans want hearings resumed at once to air the scandal and thus embarrass the Democratic politicos in office. Democratic Chairman John Blatnik, who announced several months ago that no more hearings would be held until after the election, wants to stick by that decision. Gordon Scherer, outspoken minority member, issued a press statement blasting this tack. By ignoring the Massachusetts scandal, he declared, the committee will lose the confidence of the public and raise a host of questions about its motives.

Independent real estate appraisers working for the State of Massachusetts appraised certain properties far in excess of their true market value, the BPR charged, after its investigations in the state, and it has been withholding payments for the federal share of the right-of-way involved for some time. They beat the Blatnik Committee investigators to this one.

Scrapers next . . . The BPR will begin testing scrapers and writing a standard specification for their purchase by federal agencies, much as it developed the spec for motor graders reported in last month's "Washington Newsletter."

(continued on next page)

Photogrammetric firms which heretofore have bid competitively in some states for highway surveying and mapping assignments have decided to abandon this practice. In so doing, they are concurring with a recent policy decision of the American Society of Civil Engineers that this is a professional engineering activity and so should be negotiated.

The U.S. Bureau of Public Roads, which switched to negotiation several years ago, believes that the accuracy of photogrammetry mapping will be much improved as a result. Contractors are concerned with this practical aspect, particularly in those states where earthwork quantities are determined by this method. The switch-over is expected to be accomplished smoothly now, with both the ASCE and the Association of Professional Photogrammetrists in accord on the move.

* * *

Union wages for building trades workers rose 4.1% during the year ending June 30, the U.S. Department of Labor has found. The average is now up to $3.65 per hour, not including fringe benefits. The trend is important to highway contractors who are hiring more and more building mechanics for highway structures work.

A special committee to determine what the industry's position should be in regard to financing of federal-aid highways has been created by the American Road Builders' Association. The group, headed by Harold L. Aitken, director of highways for the District of Columbia, will draft recommendations to make to Congress in 1961.

An intensive evaluation of the nation's transportation needs and policies got under way last month in Woods Hole, Mass., where the National Academy of Sciences-National Research Council staged a high-level "think" conference on the subject. Experts from all the competing transportation fields presented their case, while economists, sociologists, planners and others gave scholarly dissertations. The Academy is not quite sure what report, if any, will be publicized on the decisions, if any.

County officials went on record last month for completion of the National Interstate System not later than 1972. The move was newsworthy - and highly commended - because local road officials are sometimes charged with no vision of highway needs beyond their own backyard. The National Association of County Officials even asserted that control of access, separation of grade and other standards carefully developed by the states (but sometimes opposed by farmers) "should be scrupulously followed to protect this tremendous national asset."

* * *

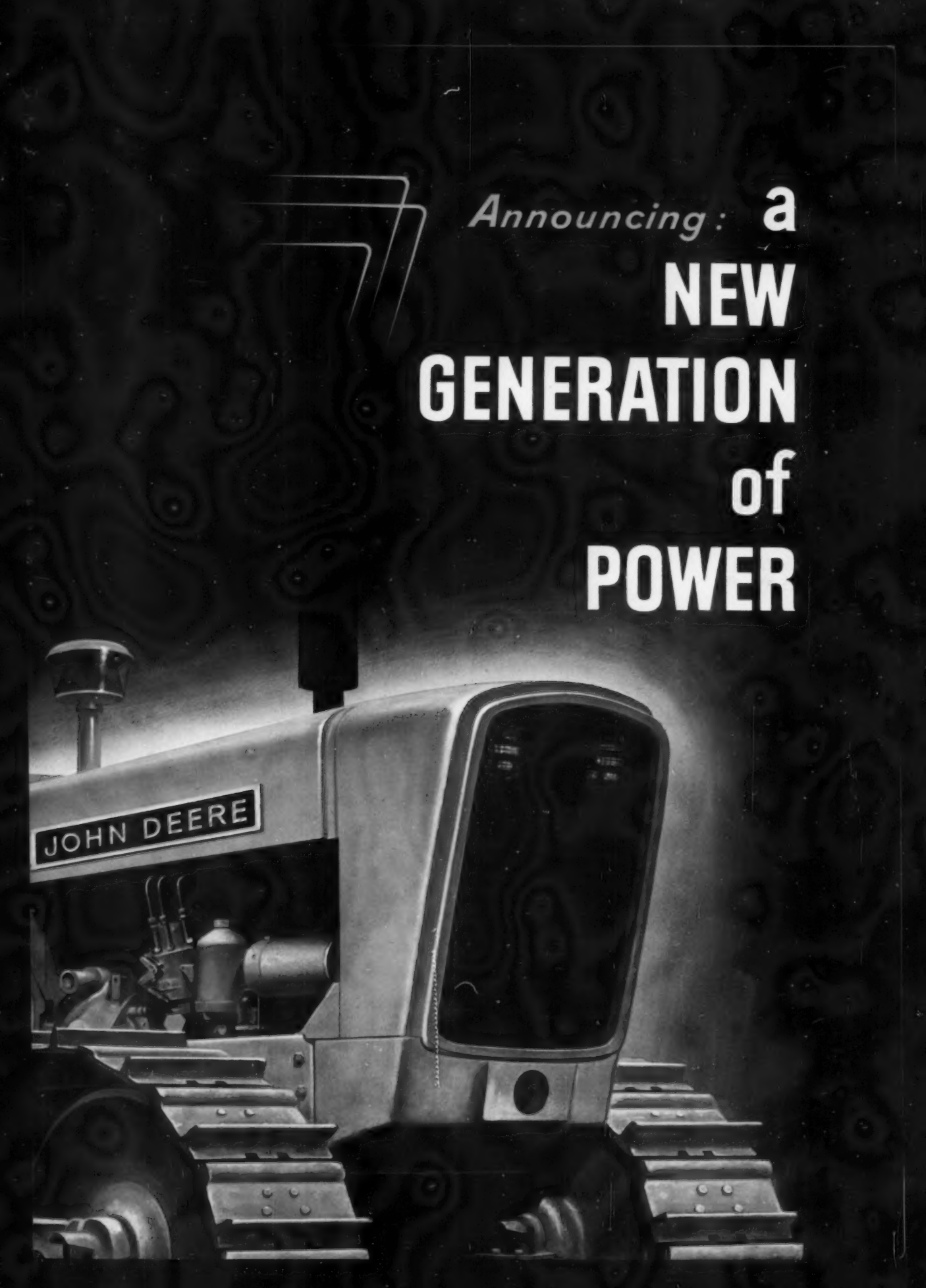
A new report on steel usage in highway construction has been released by the BPR. The findings are reported in tons-per-million-dollars of contract construction cost, by states, by highway systems, and by urban and rural requirements. Single copies available from M. B. Christensen, Chief, Construction and Maintenance Division, Bureau of Public Roads, Washington 25, D.C.

Another survey of salaries of state highway engineers has just been completed by the American Road Builders' Association. It reveals salaries for 23 engineering positions in each state, from chief executive official (average $15,817 per year) down to engineering aides ($4,082 per year).

Research offices for direction of the bituminous contractors' $1.3 million Quality Improvement Program will be located at Texas A & M, the National Bituminous Concrete Association announced last month. This is another step forward in implementation of a long-range effort which the industry is advancing to upgrade the quality of their product.

Announcing: a

NEW GENERATION of POWER



a NEW GENERATION

1010 · 2010 · 3010 · 4010 Tractors

New tractors and attachments! New ideas in design and manufacture! Six completely new tractors, ranging in size from 40 to 85 engine horsepower will be offered with the Ten-Ten series first off the line. New tractor loaders, bulldozers, backhoes, and a variety of other equipment give the fleet owner and single-unit operator more to work with . . . more to profit by.

John Deere engineers threw away the book to bring you these new power units. Years of research, development, and testing have combined the best proved engineering principles with some of the freshest ideas in the industry today. The New Generation of Power is here!

High Productivity

More usable horsepower in each tractor size—that's the advantage earthmoving contractors, pit operators, landscapers, and construction men will find in Deere power. More usable horsepower means more work per dollar invested. Coupled with fresh engineering approaches on operator efficiency, comfort and convenience, you'll speed production on a wider range of jobs.

Balanced Performance

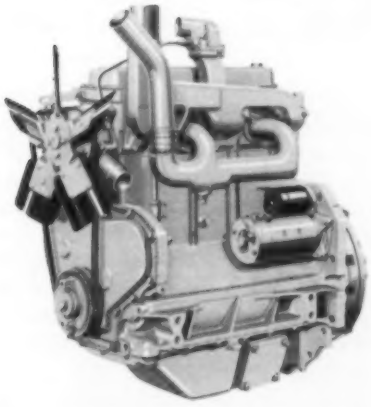
John Deere power—usable power—is day-in, day-out performance. Tractors, engines, transmissions are quality-made for full-day productivity, day after day, on job after job. Their hydraulic systems are pressure-stressed to handle continuous maximum loads without fatigue. In every respect, you can count on cost-cutting performance in this New Generation of Leaders.

# of LEADERS

JOHN DEERE

New power for profit

with John Deere's wide-range power concept



Gasoline or Diesel • 4 or 6 cylinders

Completely new tractor engines, Deere designed and built, provide a new kind of performance—wide-range power—for every construction use. True variable-speed engines offer flexible, efficient power throughout the full throttle range. Coupled with transmissions providing a wide range of application-matched speeds, these new 4- and 6-cylinder engines put the new John Deere power train far ahead in horsepower efficiency, lugging ability and balanced performance.

There is big news in hydraulic power, too. Pump designs include an advanced type new to the earthmoving industry. Plenty of pump capacity, plenty of smooth, responsive hydraulic power insures efficient operation on every job.

Choose from 2 new Crawler Loaders or

For any application *. . . Excavating, loading, material handling—name your job, and you'll find the right unit for it in the all-new John Deere loader line. You'll gain new operator efficiency, too, with improvements such as one-lever boom and bucket control.*

Powered right for high performance, the John Deere Ten-Ten Crawler-Loader meets all modern demands for a versatile, efficient unit in the 40 engine h.p. class. Sixty-six inch bucket has a rollback of 40 degrees, 8500 pounds breakout force, a full-height lifting capacity of 3500 pounds, and a dumping clearance of 8 feet, 1 inch. The Ten-Ten Crawler-Loader has a 3/4-yard bucket with 8 nodular iron teeth and is available with gasoline or Diesel power.

With extra capacity for top production, the all-new Twenty-Ten Crawler-Loader combines the 50-h.p. John Deere gasoline engine with a one-yard bucket. Fast cycle time is assured by the 40-degree rollback of the 66-inch bucket, 8500 pounds breakout, 3500-pound full-height lifting capacity and a 7-foot, 11-inch dumping clearance. Eight nodular iron bucket teeth speed excavating work in rock, frozen ground or other difficult operating conditions.

4 Wheel Loaders for greater job profits

A wide range of power matched bucket sizes, each with plenty of dumping height and pry-out power assures you the kind of loading performance you need. Whether your job calls for tracks or wheels, choose John Deere for new power and high productivity.

Valuable on any job, the compact 701 Loader for John Deere Ten-Ten Wheel Tractors has a standard 3/8-yard bucket, four feet in width, with a 20-degree rollback providing 4800 pounds of breakout force, 2000 pounds full-height lift capacity, and a dump clearance of 102 inches.

Low-cost loading is yours with the economy priced 700 Loader which mounts on either Twenty-Ten or Thirty-Ten Wheel Tractors. Bucket size is 5/8 yard. Breakout force is 4800 pounds, full-height lift 2000 pounds and maximum dumping clearance, 102 inches.

Single-lever control on the 720 Loader for Twenty-Ten and Thirty-Ten Wheel Tractors speeds operation. The 720 Loader has 6650 pounds pryout pressure, 3500 pounds full-height lift effort, and clears 99-1/2 inches for dumping. Buckets are 5/8 and 7/8 yard.

30-degree rollback gives the 740 Loader for the Forty-Ten Wheel Tractor 6650 pounds of pry-out. Bucket capacity is 7/8 yard and lift effort, 3500 pounds at full height. Dump clearance is 99-1/2 inches. The loader frame is designed to accommodate rear-mounted backhoes.

Increase trenching versatility

with a John Deere 50 or 51 Backhoe

Team the new power, handling ease and mobility of John Deere Tractors with the field-proved performance of either the 50 or 51 Backhoe! You'll take advantage of every benefit of John Deere's new advances in engine power and hydraulics, plus the greater trenching versatility these units provide. Ease of operation and quick adaptability to working conditions are your assurances of low-cost trenching for soil pipe, foundations and cable laying.

2-Lever Control. Efficient 2-lever control of boom, dipper stick, and bucket, a widely preferred feature on John Deere Backhoes during the past two years, is yours again with any backhoe combination in the line. Eliminates excess hand motion throughout a long working day; helps operator do fast, precision work.

5-Position Digging. The John Deere 51 Backhoe digs flush right or left against walls, fences or buildings. The rotary boom cylinder centers or slides to any of four off-center positions along the mounting, moved by the unit's own hydraulic power. One man with a wrench easily makes the switch in minutes right on the job.

Take your pick from 5 all-job crawler bulldozers

Need a blade for heavy pioneering, road building, or precision finish grading? John Deere has it! Five outside- or inside-mounted dozers, sized right and power matched for your needs, are included in the new line. All-hydraulic models with power tilt, angle, and cut are now operated by new single T-bar control. Operator moves control to the position he wants and the blade repeats the motion! Just one of many new ideas throughout the whole line!

For clean work at low cost, select the John Deere Ten-Ten Crawler with 610 inside-mounted Dozer. Available with 72-inch or 90-inch blade with three-piece cutting edges. Angles 18 and 25 degrees right or left, cuts to 12 inches below track level, and lifts as high as 40 inches.

Power plus flexibility is yours with the John Deere Ten-Ten Crawler and all-hydraulic 612 Dozer. Change tilt, angle or cut on the go with one control! Inside mounted, with 80-inch blade.

For big work savings, the 624 outside-mounted Dozer mounts on either the Ten-Ten or Twenty-Ten Crawler. Blade is 90 inches wide, 23 inches high with three piece cutting edge. Cuts as deep as 12 inches below track level, and is easily set to angle 25 degrees right or left. Lift is 48 inches.

Pair the extra power of the Twenty-Ten Crawler with new inside-mounted 620 or 622 Dozer. Choose from 72-, 80- or 90-inch blades with hydraulic lift or full hydraulic operation.

Dependable John Deere diesel power, teamed with a versatile elevating scraper, provides a widely preferred earthmoving combination for road and street work, land forming, and stripping overburden.

PARTS and SERVICE

Parts and service for any John Deere Tractor are always available from your nearby John Deere dealer. He and his service crew know how to service and maintain construction equipment with minimum downtime expense. Find out how this man can help you now. Check with the classified telephone directory or write John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE CREDIT PLAN

All tractors and equipment can be purchased on terms of the John Deere Credit Plan. Arrangements are made in strict confidence by your dealer. Terms are tailored to individual requirements. Protective life insurance and property insurance are also available at low cost.

LEASING PLAN

Throughout the United States, three to five-year leasing arrangements can be made through your John Deere dealer. The plan is specifically designed to enable contractors and others to obtain profitable use of the most modern, efficient equipment, without affecting needed working capital.

JOHN DEERE Earthmoving Logging Landscaping and Material Handling Equipment

JOHN DEERE

People

ASCE Staff Changes

Reassignment of headquarters staff of the American Society of Civil Engineers is announced by W. H. Wisely, executive secretary. Don P. Reynolds, assistant to the secretary, is named assistant secretary replacing E. L. Chandler who has retired. Mr. Reynolds will continue to administer ASCE's technical activities.

Don P. Reynolds

E. Stuart Kirkpatrick, recently an assistant to the secretary, was appointed executive assistant, a new post.

Donald D. King will continue as assistant to the secretary in charge of coordinating the Society's professional activities. Otis D. Gouty and John Fisk will continue as assistants to the secretary, Mr. Gouty in charge of local sections and Mr. Fisk in charge of student chapter activities.

Dickinson to Head Calcium Chloride Institute

William E. Dickinson, recently executive vice president and chief engineer of the Calcium Chloride Institute, Washington, D.C., has been named president. He succeeds George H. Kimber who becomes board chairman.

During his 14 years with the Institute, Dickinson has gained national recognition as an authority on proper use of calcium chloride in numerous industries. He is a member of the Highway Research Board Committees on Winter Maintenance and Secondary Roads, the American Road Builders' Association Committees on Winter Maintenance and Soil Stabilization.

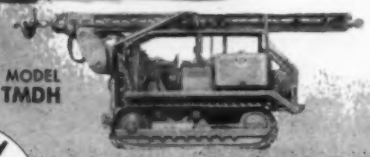
Division Chief Retires Post

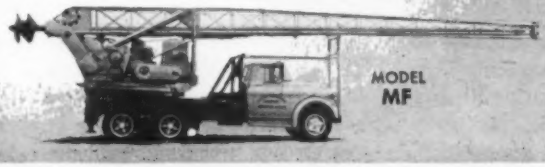
FRED V. REAGEL, who established the division of materials and tests in the Missouri state highway department in 1922, is stepping down as division chief after 38 years of service. In Missouri, division heads must relinquish administrative duties at age 65 but are given the option of remaining in special assignment work. Reagel has chosen to stay on. One of his primary duties will be to correlate the findings of the American Association of

Continued on page 34

A WILLIAMS DIGGER FOR EVERY PURPOSE!

Available in twelve models and a wide range of hole diameters from 12 to 96 inches and depths to 110 feet. Whether truck, tractor or specially-mounted the Williams Diggers will serve any purpose and, in this respect, are virtually custom rigs for the earth-boring contractor. Williams Diggers are unexcelled for sinking holes for everything from electric line poles to architectural foundation piers.





HUGH WILLIAMS

HUGH B. WILLIAMS MFG. CO.
8330 Lovett Ave. • Dallas, Texas
Manufacturer

JOSLYN MFG. & SUPPLY CO.
2101 Corinth St. • Dallas, Texas
Distributor

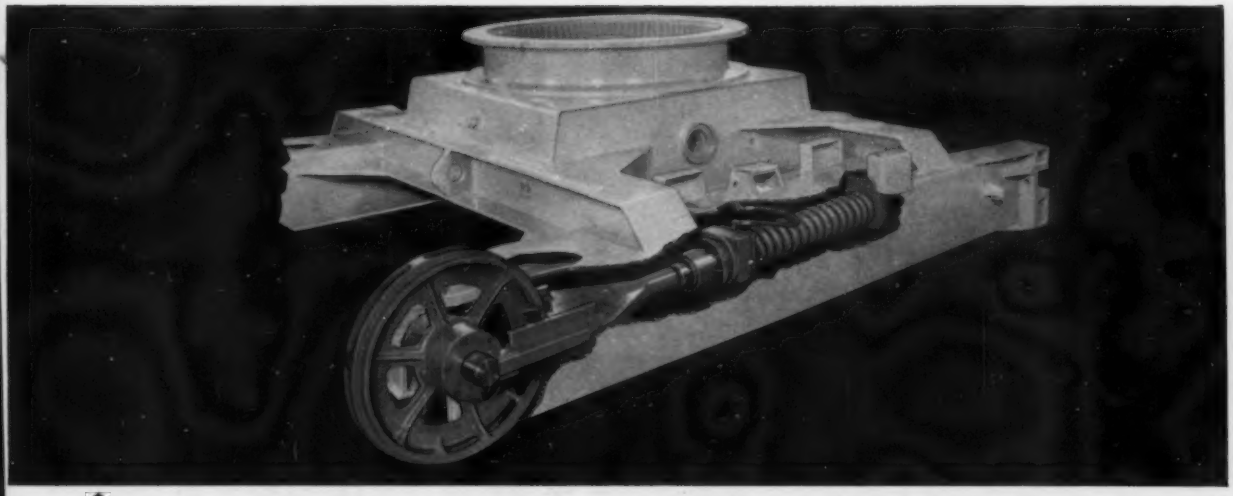
WRITE FOR ILLUSTRATED DESCRIPTIVE LITERATURE

For more details circle 353 on enclosed return postal card

Link-Belt Speeder 3/4-yd. LS-78 . . . engineered for

GROUND-HUGGING TRACTION..

This one likes to travel . . . to roam where the work is, handling skip jobs along pipeline layouts, cutting irrigation ditches, loading logs and carving out access roads. It's built to keep its feet . . . stay on-the-go with ground-gripping, tractor-type tread and exclusive compensating idler system that make track adjustments easy as greasing a fitting . . . as a matter of fact, that's exactly how it's done. On-the-go in more ways, too . . . Speed-o-Matic true power-hydraulic controls increase cycles up to 25% more per shift than manually controlled machines . . . Full-Function Design . . . optional independent-swing-and-travel. Also check Link-Belt's low-maintenance construction: completely interchangeable track and carrier rollers, all-welded, stress-relieved upper and lower frames, completely sealed lower, hydraulic power steer, more usable horsepower and the stamina needed to handle rough work assignments wherever you travel . . . with a wide stance lower featuring 22-inch-high unobstructed ground clearance. See your Link-Belt Speeder dis-



THE LS-78 WON'T WALK OUT OF ITS TRACKS — Exclusive track compensating unit relieves track tension from obstacles wedging between the track rail and idler wheel or drive sprocket. For track adjustment, a hydro-piston is grease-gun actuated. Preset safety valve prevents overtightening, ensures proper track adjustment.

ALL TRACK ROLLERS, CARRIER ROLLERS, IDLER WHEELS and track drive sprockets are mounted on sealed, tapered roller bearings. Require no further lubrication. 26-inch-wide grouser shoes and track rollers are heat-treated for long life. Completely sealed carbody protects bevel gears, steer clutches, digging brakes, all traction mechanism.

pipelining, logging, irrigation —

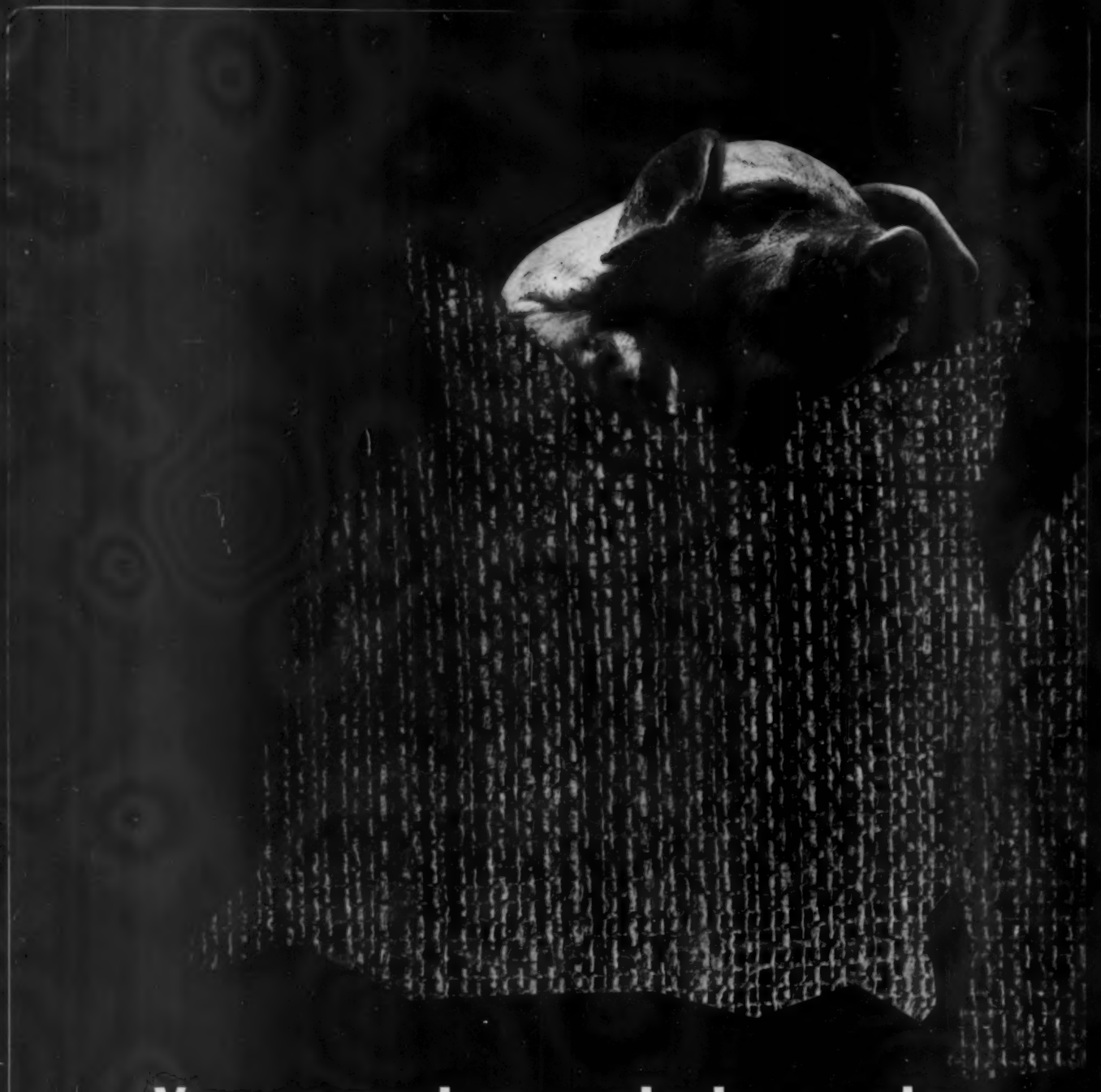
GROUND-COVERING TRAVEL

tributor for all the details on the new LS-78 ¾-yd. machine with tractor-type, work-and-travel crawler or write us for the fully illustrated catalog. Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 119-60N

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder

. . . for more details circle 328 on enclosed return postal card



You never buy a pig in a poke

when you design highway bridges with steel.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Distributor: Bethlehem Steel Export Corporation*

PREDICTABILITY
VERSATILITY
DURABILITY
ECONOMY

Steel

for Strength
. . . Economy
. . . Versatility

No guesswork! Structural steel is stable, uniform. You can calculate its ability to support loads precisely, and in advance.

Your fabricator can "tailor" structural steel to almost any shape, without sacrificing strength. You can adapt it to almost any architectural form.

Steel bridges last and last. Witness the Eads Bridge across the Mississippi. Completed in 1874, it's still on the job. And it has no intention of retiring.

Prefabricated in the shop, structural steel arrives at the site ready to go into place—in a hurry. No expensive, time-wasting field operations.

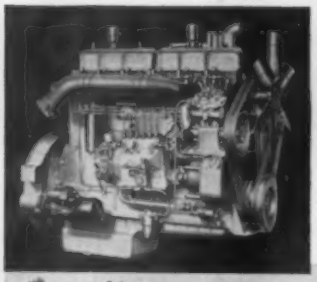
You always know exactly what you're getting.

BETHLEHEM STEEL

BETHLEHEM STEEL

. . . for more details circle 286 on enclosed return postal card

MOST PRODUCTION
with
WAUKESHA
POWER



A typical Waukesha medium six-cylinder Diesel. Other Diesel, gasoline, and gas models—up to 1200 hp.

For service—in any country—or any climate—stamina and dependability are built-in. Power packed—to pay profits in fast, smooth performance, fuel economy, and low upkeep—Waukeshas are the choice of operators and owners alike. Engine-Generator Sets (ENGINATORS®) for all standard fuels . . . from 50 to 800 KW.

488

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
Factories at Waukesha, Wisconsin, and Clinton, Iowa New York • Tulsa • Los Angeles

. . . for more details circle 351 on enclosed return postal card

People

Continued from page 29

State Highway Officials Road Tests in Illinois to Missouri conditions.

In a chain reaction set off by Reagel's reassignment, Virgil B. Saville, the Missouri department's chief of highway planning, will succeed Reagel as head of materials and tests. Richard A. Currie another veteran, steps in as chief of highway planning. Leo F. Beckett, will succeed Currie as chief of the division of bridges.

NORMAN W. EASTWOOD is made vice president, Construction Department, Merritt-Chapman & Scott Corporation. He will be responsible to Myles C. McGough, executive vice president in charge of Merritt's construction operations. Mr. Eastwood, who joined M-C&S in 1945, previously served as construction manager, and is a veteran of more than 30 years in construction.

Norman W. Eastwood

ASCE Honorary Members

Four prominent engineers have been named Honorary Members of the American Society of Civil Engineers, highest honor bestowed by the 45,000-member society. Those named are:

Guy F. Atkinson, chairman of the board, Guy F. Atkinson Co., contractors, South San Francisco, Calif.; Frank Kerekes, Dean of Faculty, Michigan College of Mining and Technology, Houghton, Mich.; Solomon C. Hollister, Dean of the College of Engineering, Cornell University, Ithaca, N.Y.; Fred C. Scobey, construction hydraulic engineer, Berkeley, Calif.

*PROVED! ACROSS THE NATION... ALLIED Jet Seal®

THE SUPERIOR JOINT SEALANT

JET SEAL APPLICATORS OFFER FAST, EFFICIENT OPERATION

The Allied-Stroud Applicators, Model 8591-D (shown above) and the NEW COMPACT Applicator (Model X691-E) offer the most efficient and complete method of joint sealant application for any sealing job.

Manufactured by Allied-Stroud Corp., a division of Allied Materials Corp., the Allied-Stroud Applicators are the ONLY sealant application equipment authorized for the application of Allied JET SEAL (Products 9015H Highway, 9015M Military, 9015T Hydraulic).

For complete detailed information about the Allied-Stroud Applicators and Allied JET SEAL, the Original two-component, polysulfide, polymer, elastomeric joint sealing compound, write to:

*

USED IN MAJOR PROJECTS EVERYWHERE
(Partial List)

- Los Angeles Internat'l Airport
- Yuma Naval Air Station, Arizona
- O'Hare Internat'l Field, Chicago
- New York Internat'l—Idlewild
- Miami Internat'l Airport
- Niagara Power Project
- New York State Thruway
- Tennessee Highway Dept.
- California Highway Dept.
- Connecticut Hwy. Dept.
- Texas Hwy. Dept.

CHECK ALLIED JET SEAL'S EXCLUSIVE ADVANTAGES

On airfields, highways, bridges, hydraulic projects—Allied JET SEAL offers tested proof of time, labor, and money-saving performance. JET SEAL is the outstanding concrete joint sealant.

- It has positive adhesion, cohesion, resilience and ductility at low temperatures (—20°F).
- It has no flow, even at elevated temperatures (200°F). Ideal for sealing vertical and overhead joints.
- Prevents penetration of water into joints. Unaffected by oils, solvents, highway salts, hydraulic fluids.
- Prevents incorporation of incompressible materials. Is extremely quick curing at all temperatures.

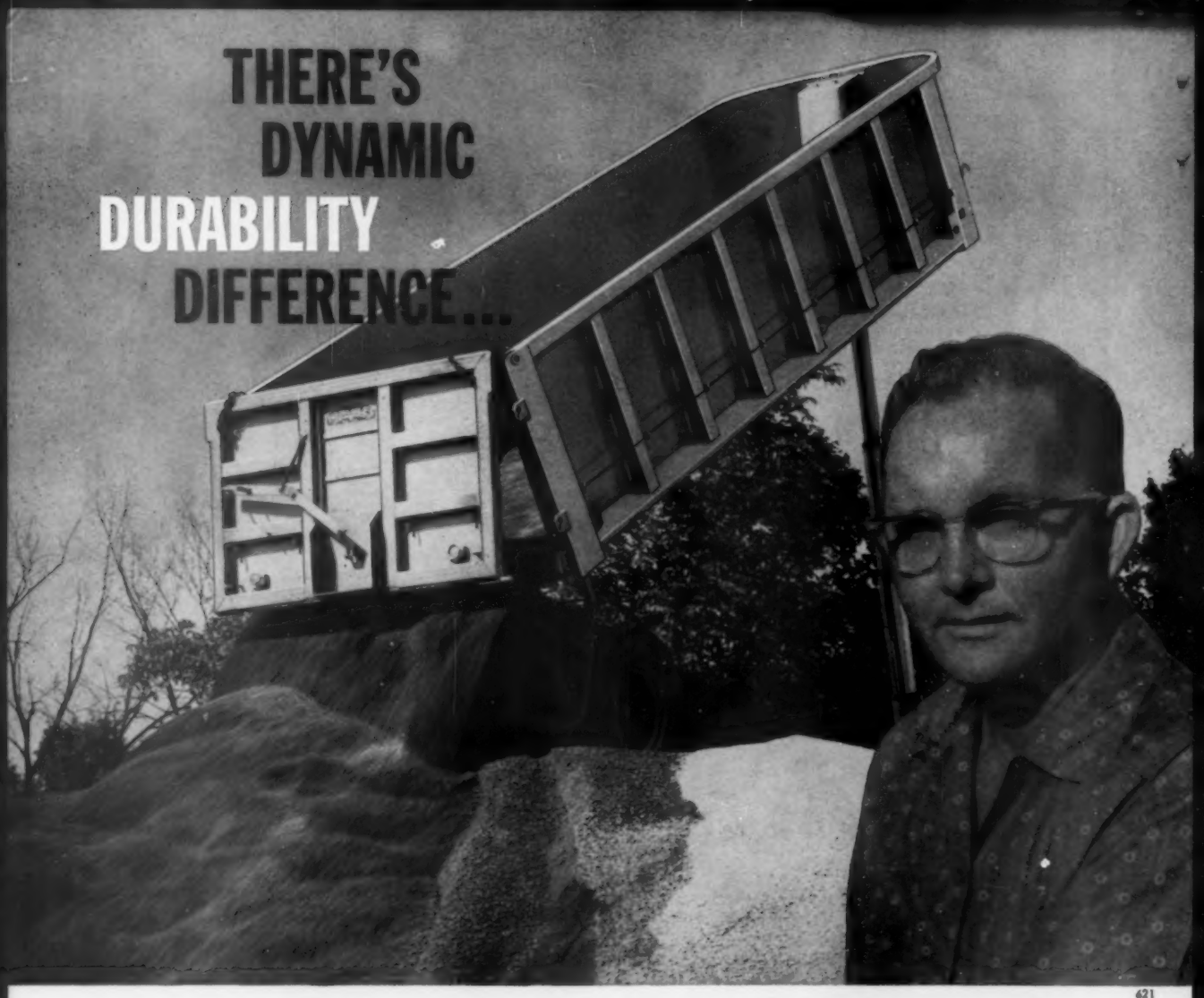
ALLIED MATERIALS CORP.

PRODUCERS, REFINERS AND COMPOUNDERS OF SPECIAL ASPHALT PRODUCTS

ALLIED BUILDING 5101 N. PENNSYLVANIA P. O. BOX 7278 39TH STREET STATION OKLAHOMA CITY, OKLAHOMA

PLANTS: STROUD, OKLA. DETROIT, MICH. LOS ANGELES, CALIF.

. . . for more details circle 276 on enclosed return postal card



621

"We'll pocket MAINTENANCE COSTS for 10 years— by switching to Hercules aluminum dump trailers!"

Reports C. R. Leffler Trucking Company, Richland, Pennsylvania

"Each of our five Hercules aluminum dump trailers provides about 3000 lbs. of extra payload per trip," says Carlos R. Leffler, owner of the C. R. Leffler Trucking Company, Richland, Pennsylvania. "But that's only a part of the *total savings* we got by switching from 22-ft. steel bodies to 24-ft. aluminum dump trailers . . . for hauling coal, slag, stone, ferromanganese and sand.

"Our Hercules *aluminum* bodies are sturdier, less easily damaged, and *require no painting or other maintenance.* This holds upkeep and downtime costs to a minimum. On initial cost, we figure added payloads will take care of the difference in about 14 months. We estimate our Hercules aluminum dump trailers will be in service 10 years, or longer.

"This means, we expect at least 8½ years of profitable increased payloads, plus better appearance and all the other advantages provided by aluminum equipment."

Want to know what Hercules aluminum dump trailers can do for you? Why not check with your Hercules distributor or write Dept. C-760.

Hercules DUMP BODIES, HOISTS AND DUMP TRAILERS

HERCULES STEEL PRODUCTS COMPANY • GALION, OHIO • U.S.A.

. . . for more details circle 312 on enclosed return postal card

Make it a NORTHWEST—

THE statement is not an advertising headline. Check it on the job where Northwests are working. Experience that has generated this thinking is one of the things that has made one out of every three Northwests sold a repeat order.

Your Northwest is always ready to go. You'll hear it everywhere! Built to keep you out of trouble, Northwest design begins from the bottom up with the idea that real output can result only from continuous operation. Cast Alloy Steel Crawler and Rotating Bases for permanence and strength — alternate crawler widths and lengths to fit any type of job — High Speed Independent Boom Hoists — 3rd Drums — The Northwest Feather-Touch Clutch Control are just a part of the story. From Crawler to Boom Point there is an unbeatable combination of advantages all aimed at getting the job done. Before you buy your next machine, get the whole story from a Northwest man.

NORTHWEST ENGINEERING COMPANY
1504 Field Building • 135 South LaSalle Street
Chicago 3, Illinois

C-6-20-LC

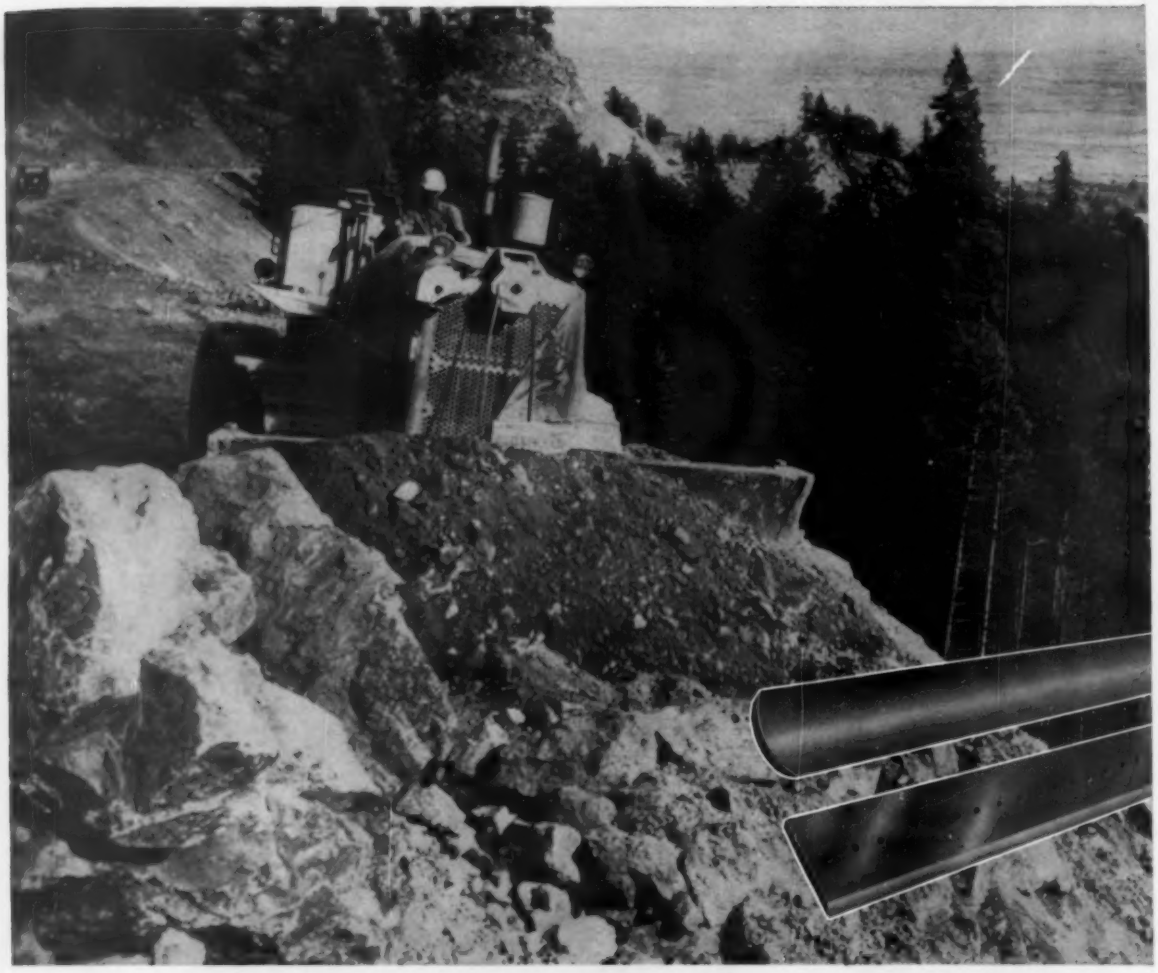
And get the Job done!

"THEY'RE ALWAYS READY TO GO!" You can say...

CRANES
SHOVELS
DRAGLINES
PULLSHOVELS
TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

NORTHWEST



Get more operating hours per dollar of blade cost with CF&I Cutting Edges

In cutting edges, it's the *quality* that counts. A dependable, long-lasting blade on the mouldboard of your bulldozer is your protection against blade changes, work stoppages and time-consuming maintenance operations —all of which add up to costly downtime for you. That's why it's just good business sense to specify CF&I Cutting Edges for your earthmoving operations.

CF&I Grader Blades and Cutting Edges are—

• **Made to last . . .** scientifically designed to stand up to the toughest punishment. Hot rolled from special analysis, new billet, open hearth steel, they're free from hard and soft spots. Holes are cold drilled and punched.

• **Produced for easy, on-the-job installation,** to your exact specifications . . . in a wide variety of lengths, widths, thicknesses and hole spacings, in flat or curved designs, with squared or beveled edges.

• **Readily available . . .** from CF&I distributors located throughout the United States.

Add these factors up, and they total more value for your Grader Blade dollar. For detailed information on your requirements, get in touch with your CF&I distributor or sales office today.

CF&I STEEL

CUTTING EDGES

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION** — Albuquerque • Amarillo • Billings • Boise Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans New York • Philadelphia

7900

. . . for more details circle 293 on enclosed return postal card

Publications

Accident Facts

The National Safety Council's 96-page "Accident Facts", for 1960 is now available.

It contains thousands of figures on all kinds of accidents. Several sections are devoted to work accidents, and provide a comprehensive background for an industrial safety program. Included are accident rates by major industry groups, and facts on accident trends and off-the-job accidents.

Further information on "Accident Facts," and quantity prices, the National Safety Council, 425 N. Michigan Avenue, Chicago 11, Illinois.

PRESTRESSED BRIDGE BEAMS, VOL. I. By Kenneth K. Kienow and John B. Scott. Published by Western Computing Consultants, P.O. Box 4906 Tucson, Arizona. Price $6.00 for single copy; reduced price for five or more copies. This 40-page volume contains detailed design data in readily useable form, developed using an IBM 650 electronic computer.

TWO-WAY RADIO IN HIGHWAY CONSTRUCTION. Bulletin 246, Highway Research Board, 2101 Constitution, Washington, D. C. Price $.80. A paper by H. R. Kreig and John W. Krichbaum discusses the planning, installation and use of two-way radio in maintenance and construction operations in the Ohio Department of Highways.

A COMPILATION OF ASTM STANDARDS on bituminous materials for highway construction, waterproofing and roofing is available from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.

The 488 page manual includes 115 standard specifications, methods of test, recommended procedures and definitions. The price of the book in a paper cover is $4.75 and is available on remittance to ASTM.

Use Dietz Visi-Flash Lights to alert the oncoming driver. Brightest, safest, most trouble-free flashers on the market. Warn: "Danger Ahead" for up to 1500 hours without changing batteries.

Use Dietz Lanterns to locate hazard in relation to driver's position. Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

Use Dietz Torches to guide driver around the hazard. Fully illuminate the danger in every weather. Burn up to 48 hours on low cost kerosene.

Go DIETZ and you go Safely

It's Fall . . . shorter days . . . still lots of traffic!

Proper lighting of the highway hazard is an essential investment to protect the public, workers, and equipment, and to eliminate potential causes of costly lawsuits.

NEW! DIETZ
HAZARD WARNING PLANNER

A Practical On-the-Job Tool! Quickly and easily shows how, when, and where to use each type of warning light for maximum safety under all weather conditions and all types of roads and speeds.

Send $1.
for each Planner — personalized with your name

R. E. DIETZ COMPANY
Dept. 89 Syracuse 1, N. Y.

. . . for more details circle 298 on enclosed return postal card

"NEW SIZE AND STRENGTH MARKINGS ON LACLEDE REINFORCING BARS

make them easy to identify . . . save time and construction costs."

Pick up any Laclede Multirib reinforcing bar. A rolled-in marking immediately tells you its size, strength and manufacturer. Laclede Multirib bars of high strength steel are rolled to conform to the two new ASTM standards: A-432 for 60,000 psi minimum yield point steel, and A-431 for 75,000 psi minimum yield. These bars can be used with assurance under the Ultimate Strength design methods included in the new A.C.I. building code. Bars of either 60,000 or 75,000 psi yield strength are identified by one and two longitudinal ribs, respectively.

These high-strength steels can contribute a saving of as much as 15% in the total construction cost of a concrete structure. The worker in the field can quickly find the right bar specified for the job; with the grade of steel well identified, many inspection and laboratory test charges may be eliminated.

For your next construction job, specify these time-saving, money-saving Laclede Multirib reinforcing bars.

4034

Steel

LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

. . . for more details circle 326 on enclosed return postal card

LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge — no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed — no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control — no gear shifts — no declutching — no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat — engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

LIMA
Shovels—to 6-cu. yd.
Cranes—to 110-tons
Draglines—variable

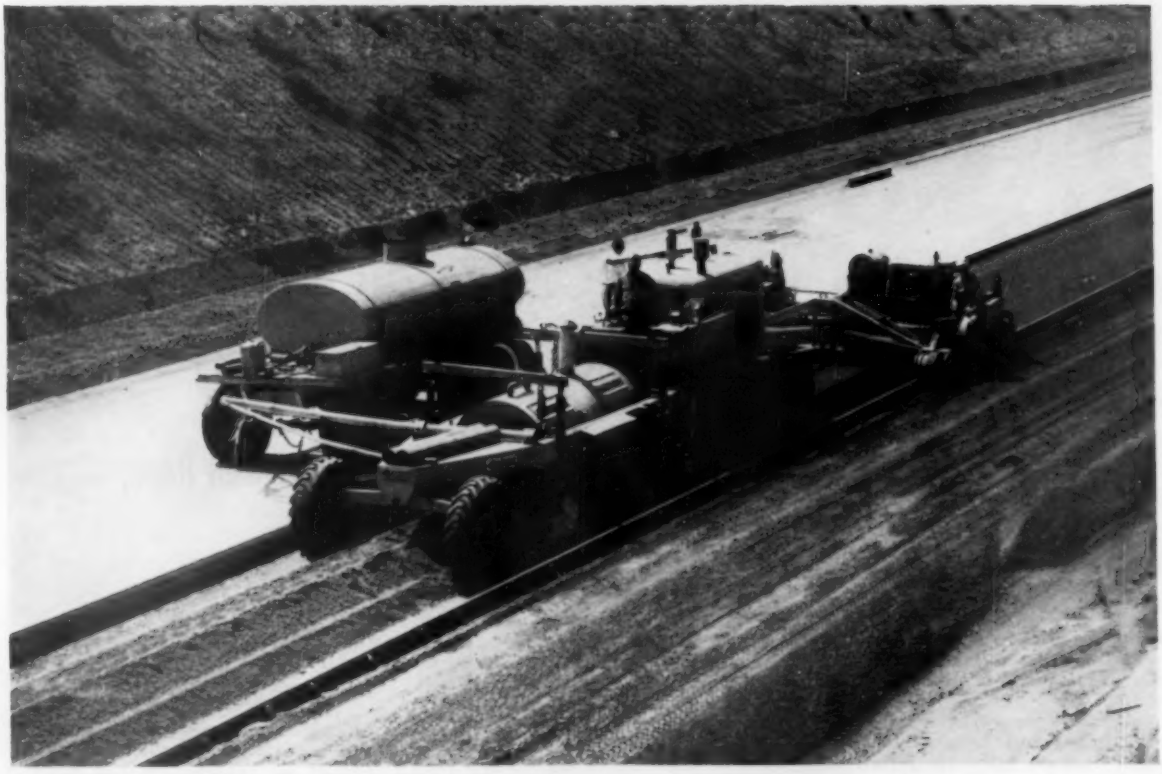
LIMA SUPER ROADPACKER
For the large construction jobs such as superhighways, air bases and earth-fill dams, Lima offers the Super Roadpacker with two rows of six hydraulically controlled vibratory shoes. Compacting widths up to 15 feet.

LIMA AUSTIN-WESTERN
Crushing, Screening and Washing Equipment

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON 5948
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

. . . for more details circle 284 on enclosed return postal card

Stationary plant quality...
Traveling plant economy!



PETTIBONE WOOD STABILIZATION MIXER
Mixes soil-cement at 550 tons per hour

The PETTIBONE WOOD Model 54-S Self-Propelled Stabilization Mixer produces up to 550 tons of soil-cement stabilized base per hour—with stationary plant quality!

The 54-S is PETTIBONE WOOD's answer to bigger-capacity production for the accelerated highway program. More than a mile of soil-cement road, or several blocks of soil-cement streets often are built in ONE DAY using PETTIBONE WOOD equipment.

One-man operated, the 54-S picks up aggregates cleanly off the subgrade, mixes it with binders in a 54" pugmill and lays it down in a uniformly mixed windrow ready for spreading. Electronic controls are available to maintain constant depth control.

Pettibone Wood stabilization equipment is used for highway, airport and parking lot construction the world over. Write today for free job studies and your copy of "The A B C's of Soil-Cement Stabilization", an informative, 36 page booklet on stabilization techniques.

PETTIBONE
A SUBSIDIARY OF PETTIBONE MULLIKEN CORP.
WOOD MFG. CO.

PETTIBONE WOOD MFG. CO.
P. O. BOX 620, NORTH HOLLYWOOD, CALIFORNIA
Originators of mix-in-place roadbuilding equipment

. . . for more details circle 338 on enclosed return postal card

American Pipe and Construction Co., operating throughout the West from headquarters near Los Angeles, offers a wide range of reinforced concrete pipe for virtually every water supply, sewerage and drainage pipeline requirement. The company chose Fuller 5-C-720 Transmissions for heavy hauling because of their work-matched gear ratios, low gear-tooth pressures, helical gearing in all forward speeds, short length and light weight.

Geared by Fuller . . .

More profit from JOB-SPECIFIED Transmissions

Whatever you're moving — concrete pipe or cotton, radishes or rock — there's a Fuller Transmission to help you do the job faster, easier and more profitably. Fuller offers:

- 88 models of heavy-duty transmissions for trucks, construction equipment and industrial use.
- Capacities matching gasoline, diesel and LPG engines . . . from 330 to 1550 cubic inches . . . up to 600 hp.
- Models available with manual and semi-automatic shifting, or with the new, all-air-actuated Fullair Control.

Your job writes the specifications for the Fuller Transmission engineered to boost *your* profits. Get full details from your dealer.

FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Automotive House, Great Portland Street, London W.1, England, European Representative

. . . for more details circle 303 on enclosed return postal card

Job Safety

"Those Cheap Jobs"

The investigation recently ordered by Mr. William L. Batt, Secretary of Labor and Industry, into a recent wave of cave-ins on excavation projects has brought forth an effort by the Department to crack down on those few contractors who think more of a dollar than a worker.

So comments a bulletin of the Constructors Association of Western Pennsylvania to its members. The Association furnished all contractor members with copies of new regulations and the forms needed to comply with labor regulations and "thereby maintain the high standard of safety for which this Association is so well known."

"In recent years," the bulletin continued, "the ethical members of this Association have refused to bid on small pipeline projects, knowing that their competitors would be doing the work in a careless manner in a foolish effort to keep their costs down. Since many owners are letting work on a price basis only, with no thought to the integrity of the contractor, or the need for safety measures on the work involved, safety minded contractors have been priced out of the business, while the competition injures, maims, and kills their workers in an effort to do a cheap job."

This bulletin also questions Mr. Batt: Should not the owner who allows a contractor to "cut corners" be held equally responsible for the contractor's negligence?

"It's unwise to pay too much," said the contractor association spokesman, "but it's worse to pay too little. When you pay too much, you only lose a little money, but if you pay too little, you may lose everything because the thing you bought was incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little, and getting a lot. It can't be done."

Use the Proper Fire Extinguishers

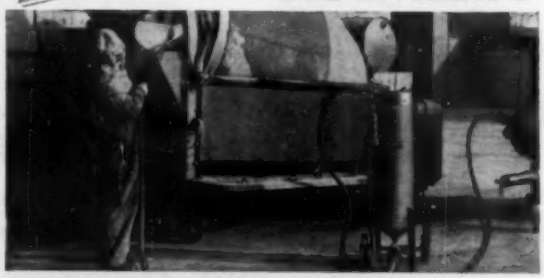
Contrary to tradition, water is not the cure-all for fire protection. The importance of having the proper extinguishers for the proper locations is illustrated by the following occurrence:

Asphalt kettle heaters, being used on a construction job, were left too long without supervision, overheated, and the asphalt burst into flame. Workmen close by turned a water hose on the fire, causing the asphalt fire to spread over the floor, making matters worse. The fire department was called, and extinguished the fire. Had a portable dry-chemical type extinguisher been on hand, the destruction would not have been so great.

For Paving or Patching
HOT WITCH
HEATED ROLLER . . . ROLLS HEAT INTO ASPHALT AND BONDS IT . . .
LOW COST L-P GAS FIRED ROLLER
• Use hot or cold mix
• For paving asphalt medians, patios, etc.
• Patch streets and driveways
• 18" Roller width
• Handle extends to 10'
• ¼" Side clearance
• 225# Wt., incl. fuel
• Compaction = 5 T. dead wt.
CHARLES Machine Works, Inc.
901 B STREET • PERRY, OKLAHOMA • FR 6-4484

. . . for more details circle 295 on enclosed return postal card

PREFERRED FOR Powerful Abrading Action RUEMELIN



SAND BLAST GENERATORS!

Rugged Ruemelin Generators produce a high velocity abrasive stream to meet all pressure blasting requirements. Remove rust scale, paint. Clean bridges and remove laitence from cement. Clean ready mix trucks and highway equipment prior to re-painting. Equipped with remote control with dead man valve for stop and start at the nozzle! Wet type nozzles also available if desired. Portable units can be equipped with hi-speed mountings for highway trailering.

Write for free bulletin on complete line.

RUEMELIN MFG. CO.
3990 N. PALMER STREET MILWAUKEE 12, WIS., U. S. A.
MANUFACTURERS AND ENGINEERS — SAND BLAST AND DUST COLLECTING EQUIPMENT — WELDING FUME COLLECTORS

. . . for more details circle 355 on enclosed return postal card

New PYRALUX

TRADEMARK

FLUORESCENT ENAMEL

multiplies "see power"

"I didn't see it in time," are common words after an accident. That's why Du Pont now offers operators of highway construction equipment a brilliant new answer to danger situations involving visibility —PYRALUX, a hyper-intense fluorescent enamel that reflects up to four times as much light energy as conventional (ordinary) colors of the same hue.

From every operational viewpoint, high-visibility PYRALUX helps reduce accidents and their costly results. Use on aircraft and truck fleets has already proven this great safety potential.

The standout shades of PYRALUX retain their vivid color identity even at great distances . . . a terrific advantage where speeding cars overtake heavier, slow-moving units going to or from a job. Hazards on the job site are considerably lessened, too. You can choose from four different colors—Corona Vermilion (shown), Cosmic Yellow, Sunset Orange and Comet Red.

PYRALUX Enamel uses new pigments to extend its fluorescent life to many months of continuous outdoor exposure. PYRALUX Clear applied over the enamel increases exterior color durability even further. Both are fast-drying and are applied by conventional spray methods. For big dividends in safety, order new Du Pont PYRALUX Enamel today!

The brilliant PYRALUX Colors are packed in gallons and quarts. Du Pont T-8805 Reducer is available in quarts, gallons and fives. PYRALUX Clear in quarts and gallons.

Du Pont PYRALUX is distributed nationally through automotive jobbers. Consult phone book for jobber nearest you.

Du Pont ***research leads refinish progress***

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Where heavyweights move job records prove...

FIRESTONE TIRES KEEP BIG WHEELS TURNING!

Look to Firestone to help keep big wheels turning—to keep the cycle going and the project moving smoothly toward your finish date! That's because Firestone off-the-highway tires have built-in toughness to take rugged abuse and reduce your downtime. Shock-Fortified nylon cord, for example, guards against impact damage. And Firestone Rubber-X, the longest-wearing rubber ever used in Firestone off-the-highway tires, provides a big payoff in extra service hours. Investigate Firestone's Giant Tire Service for tires and maintenance matched to every need of every project on your docket. Call your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT

Super Rock Grip Wide Base* Super Rock Grip Deep Tread*

TUBELESS OR TUBED

Firestone

BETTER RUBBER FROM START TO FINISH

Copyright 1960, The Firestone Tire & Rubber Co.
*Firestone T.M.

. . . for more details circle 306 on enclosed return postal card

Interstate road program moves ahead in Utah

USS Highway products help pave the way . . . see inside

Utah's new Interstate road

There are almost 1¼ million pounds of structural steel and 3,200 cubic yards of concrete in the Beck's Springs Overpass north of Salt Lake City. Design allows for expansion from four to six lanes. USS Structural Steel used here will withstand great abuse, effectively resist tension, torsion, compression and shear, and can be erected in any weather in which men can work because it's easy to rivet, weld or bolt. This bridge was fabricated and erected by the American Bridge Division of U. S. Steel.

Here USS Steel Sheet Piling is used as a retaining wall along the Salt Lake City Freeway. Nearly 44,000 square feet of steel sheet piling retain the fill next to adjacent property on the east side of the highway.

program moves ahead

USS Highway Products play a big part

Under the direction of C. Taylor Burton, Chairman of the State Road Commission, and Director of Highways Elmo R. Morgan, 965 miles of Interstate roads have been authorized in Utah. 40 miles have already been completed, 82 additional miles are now under construction. In addition, 66 of 600 planned bridges have been completed.

Highway products from U. S. Steel are playing a big part in Utah's new Interstate Road system. In the bridges, for instance, the strong USS Structural Steel being used is one of the most economical of load carrying materials. It is available for the construction of bridges of all types in a number of USS High Strength Steels as well as structural carbon steel. Other USS products include reinforcing bars in the bridges, AMERICAN Welded Wire Fabric in the roads, and high strength steels and wire rope in cranes and other machinery. For safety, U. S. Steel supplies signs, posts, guard rail and galvanized sheets for culverts.

Approximately 1,600,000 cubic yards of blast furnace slag from Columbia-Geneva Steel Division of U. S. Steel will be used as embankment material on a new project recently awarded by Utah State Road Commission. Known as Interstate Highway Route 15, the project spans a 4.94-mile section where blast furnace slag will provide a stabilized embankment for the pavement and shoulder area.

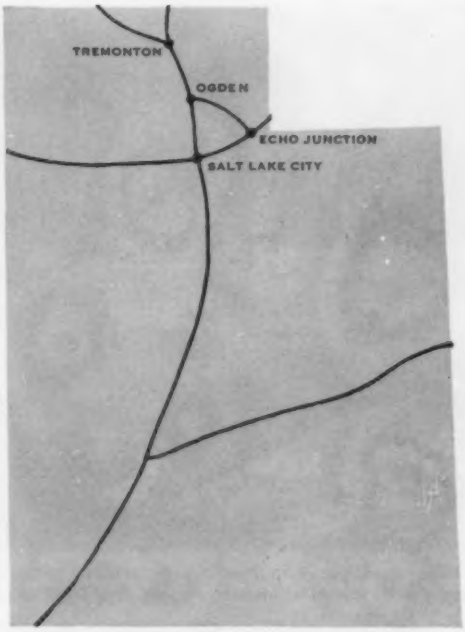
USS, Di-Lok, Tiger Brand, and American are registered trademarks

Send for U.S. Steel's **free** *54-page booklet, "Keep Our Roads on the Go." It tells how the complete range of highway products and services available from U.S. Steel can cut costs and speed operations in every phase of highway construction. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.*

USS United States Steel

The highway market also is served by the following divisions of United States Steel: American Bridge Division, Pittsburgh, Pa. • American Steel & Wire Division, Cleveland, Ohio • Columbia-Geneva Steel Division, San Francisco, Calif. • Consolidated Western Steel Division, Los Angeles, Calif. • National Tube Division, Pittsburgh, Pa. • Tennessee Coal & Iron Division, Fairfield, Alabama • Universal Atlas Cement Division, New York • United States Steel Supply Division, Steel Service Centers, Chicago, Illinois.

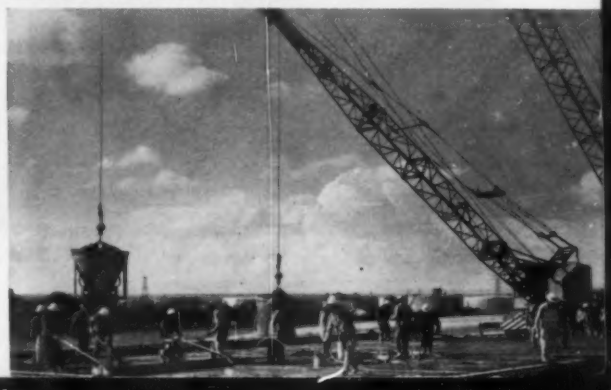
. . . for more details circle 349 on enclosed return postal card



Map shows Utah's new Interstate highway network.

808 lineal feet of strong, long-lasting steel handrail gleam in the mountain sun on this bridge on the Davis Freeway near Bountiful, Utah. Steel products like these contribute to the safety of traffic on modern Interstate Roads.

USS Tiger Brand Wire Rope, seen here on these gigantic cranes, will lift heavy loads for a long time. The bridge is also being built to last, with the use of USS *Di-Lok* concrete reinforcing bars. STEEL, wherever you look—insures strong, long-lasting structures.



Job and Equipment Ideas

Swiveling push plate on one No. 70 scraper specially built for Obert, allows off-angle push tractor approach without denting dozer blade or endangering tires.

Swivelling Push Plate Protects Dozer Blade

Here pictured is one of several seemingly minor special devices used by an Illinois grading and stripping contractor, A. G. Obert, of McDonough County, Illinois. This push plate on a Cat No. 70 scraper swivels, allowing an off-angle pushing approach by the tractor operator with less chance of denting the dozer blade or damaging the tires. The picture tells the whole story. Obert's advice to others who might have such a plate made up: be sure the framing and bolting are plenty strong.

Faster Start-Ups After a Rain

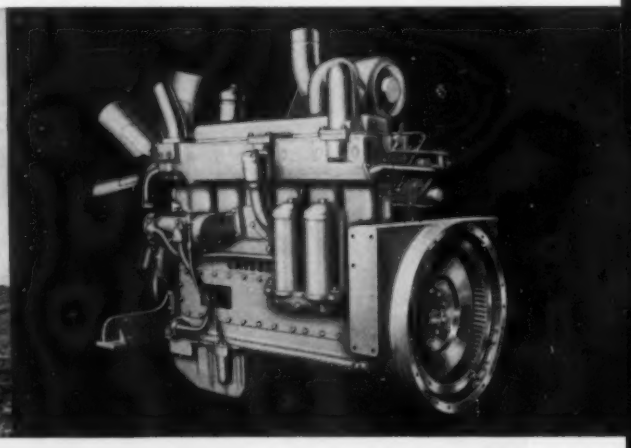
It's an old trick, but many earthmoving contractors still do not work it as often as the experts recommend: peel away the top mud when you want to get moving after a rain, or when a haulroad needs quick de-slicking.

The accompanying photo shows how a roll of wet clay was bladed off a haulroad on the Ohio Route 1 project of C. F. Replogle. This truck was worked frequently, and in the instance shown it helped the service rigs do the swift-change "PM" work on the firm's large fleet of scrapers and tractors. And (if it is through raining) this trick will enable Replogle Company's outfit to get going sooner and haul perhaps in a higher gear.

Note the roll of top mud, just peeled away by two or three passages of the motor grader.

NEW CAT NO. 14 SERIES C MOTOR GRADER

Compact engine plus many other refinements assure top performance, easier servicing, long life



Important changes make up the new Series C No. 14 Motor Grader—big improvements throughout to give you better performance, long life and servicing ease:

NEW COMPACT 150 HP ENGINE The short, rigid block and stress-relieved crankshaft give greater strength and shock resistance. New cylinder head design resists distortion yet has superior cooling characteristics. Large water pump with cast-iron impeller, ceramic seal face, and carbon type seal combined with a 20 per cent increase in radiator capacity improves cooling, lengthens life.

NEW STARTING ENGINE All-weather starting with this new two-cylinder vertical gasoline engine is assured. Replacing the horizontal engine, this design features aluminum pistons and overhead valves for improved performance. Bore is 2.38″, stroke is 2.38″, and compression ratio is 8:1. Over-running clutch in starter pinion prevents damage to starter engine when diesel starts, a year-round starting plus.

NEW SERVICING EASE An advanced fuel system is designed for easier servicing and more efficient operation. Compact fuel injection pumps with barrel and plunger assemblies enclosed in housing help reduce wear, lengthen service life.

Plus all the features that made the No. 14B the most versatile motor grader in the "big machine" field . . .

EXCLUSIVE OIL CLUTCH —provides up to 2000 hours of service without adjustment, equal to about a year of "adjustment-free" operation.

DRY-TYPE AIR CLEANER —removes 99.8 per cent of all dirt from intake air. Can be serviced in five minutes.

MECHANICAL CONTROLS —provide easy engagement. "Anti-creep" lock makes blade stay put under load.

FULL VISIBILITY —operator has unobstructed view of job even while seated.

Now, all Cat Motor Graders feature the compact engine. Like the new No. 14C, the 85 HP No. 112E, the 100 HP No. 112F, and the 115 HP No. 12E are all designed to give you the highest production at the lowest possible cost. Your Caterpillar Dealer can give you the facts and figures. He can prove it both on paper and on your job. Call him today.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE NEW NO. 14C MOTOR GRADER— MADE FOR THE BIG JOBS

. . . for more details circle 291 on enclosed return postal card

Hydraulically controlled Model 210 A-W crane inches 18-in. cast-iron water main into position in San Diego County, Calif.

How A-W crane speeds pipelaying

"The more we use our 3-year-old Austin-Western hydraulic crane, the more uses we find for it," states B. K. Stoneman Sons, Inglewood, Calif., mechanical contractor.

"For instance," they add, "it is excellent for pipelaying. Hydraulic controls permit placement of heavy pipe with speed and precision. The telescoping boom lets the operator work pipe forward for a perfect joint without even moving the machine. All-wheel drive and steer mean exceptional maneuverability and traction on any surface. The A-W is a real time and money-saver!"

Austin-Western now offers a complete line of *lift, carry and place equipment.* 5 models—capacity ranges up to 11 tons. Wide choice of optional equipment for added versatility. Available self-propelled, truck or stationary mounted. No other crane offers you all of the profitable advantages and quality construction features of an Austin-Western. Let us prove this to your satisfaction. Write for all the facts or ask your nearest A-W distributor.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

. . . for more details circle 282 on enclosed return postal card

11,300 Contractors in State Road Picture

A total of 11,300 contractors are currently eligible to bid on state highway and bridge construction contracts, Bertram D. Tallamy, Federal Highway Administrator, announced today. Eighty-five percent of the total number are small business enterprises.

The list does not include several thousand additional contractors who do local, urban and private road, street and bridge construction but who haven't become identified with the state lists.

The information was compiled by the Bureau of Public Roads from lists obtained from the highway departments of the 50 states, the District of Columbia, and Puerto Rico. These highway departments, which let contracts for Interstate and other Federal-aid construction work as well as for work financed with their own funds, each maintain listings of contracting organizations currently qualified, licensed, or otherwise recognized as competent to bid on highway and bridge contracts.

Included in the 11,300 total are contractors capable of performing all of the many varied operations of highway and bridge construction. Some are equipped to perform any type of work while others limit their activity to certain phases of construction such as grading, paving, drainage structures, bridges, sign erection, landscaping, and small specialty items.

The great majority—9,590 or 85 percent—are eligible to bid in only one state and presumably may be classed as small businesses. Another 919 contractors, or 8 percent of the total, are eligible to bid in two states; in many cases they represent small businesses favorably located with respect to two adjacent states and thus able to bid in both. An additional 330 contractors, or 3 percent of the total, are eligible in three states.

The remaining 461, or 4 percent are active in more than three states. On the average, each of them is eligible to bid in seven states. This group generally encompasses the largest, as well as the most widely operating, organizations in the highway and bridge contracting industry.

The number of contractors ac-

tively engaged in highway and bridge construction is in a constant state of change because of new business starts, mergers, shifting of activity to and from other related construction fields, and failures and voluntary retirements.

Billboard Ban is Upheld

The Appellate Division of the New York State Supreme Court has ruled that billboards and other advertising signs that impair traffic safety may be barred from private land along the highways.

The Superintendent of Public Works could, as a highway safety measure under this ruling, prohibit billboards and other roadside advertisements by obtaining easements under the real property law.

The Appellate Division upset, in a 4-1 decision a Supreme Court ruling in Sullivan County. The lower court had ruled in favor of five property owners who brought action to force the state to give up an easement along a section of Route 17, the Monticello bypass.

Why Better Roads Are Needed

Editor's Note: One of the best wrap-ups of the highway "sales story" we've seen is to be found—of all places—in an advertisement of an equipment manufacturer.

We refer to Iowa Manufacturing Company's ad on pages 143-146 of this issue. Entitled "43 Reasons Why America Needs Better Highways" this statement contains enough ideas and factual information to spark an entire grass roots campaign.

This message ought to be in the hands of every newspaper editor, radio and TV station in every community. We understand that reprints are being made available, either through Iowa's distributors or their home office. Or, the Editors will be glad to pass along your request for copies.

At least *read* this non-commercial statement yourself. As a contractor, engineer or highway official, you will get a fresh picture of the role of modern highways, a picture that needs urgently to be instilled in the public mind.

California paving contractor says:

Liked A-W roller so well, bought two more!

"Our first A-W performed so well that we bought two more over a period of 5 years. We use them to roll both subgrade and finish courses. They are fast and efficient machines; and can deliver the 95% relative compaction required. Torque converter allows more positive control of rollers for uniform compaction. Hydraulic controls make them easy to operate. Plenty of visibility for operators to do precision jobs. The A-W rollers are well-built; maintenance has been no problem."—*Pat Regan, Exec. Vice Pres., A. J. Raisch Paving Co., San Jose, Calif.*

A-W 3-wheel rollers available in 8 to 11, 10 to 12, 12 to 14-ton models; tandems 5 to 8, 8 to 12, 10 to 14 tons. Portable tandem variable between 3½ to 6 tons. Vibratory Roller Compactor and Widener Attachment also available. Choice of gasoline or diesel power; torque converter with 4-speed transmission optional.

Austin-Western offers you a number of important dollar-saving features not available on many other makes of rollers. Let us prove to you the ways in which A-W rollers can increase your compaction efficiency and decrease maintenance and operating costs. Contact your nearby Austin-Western distributor or write directly to us.

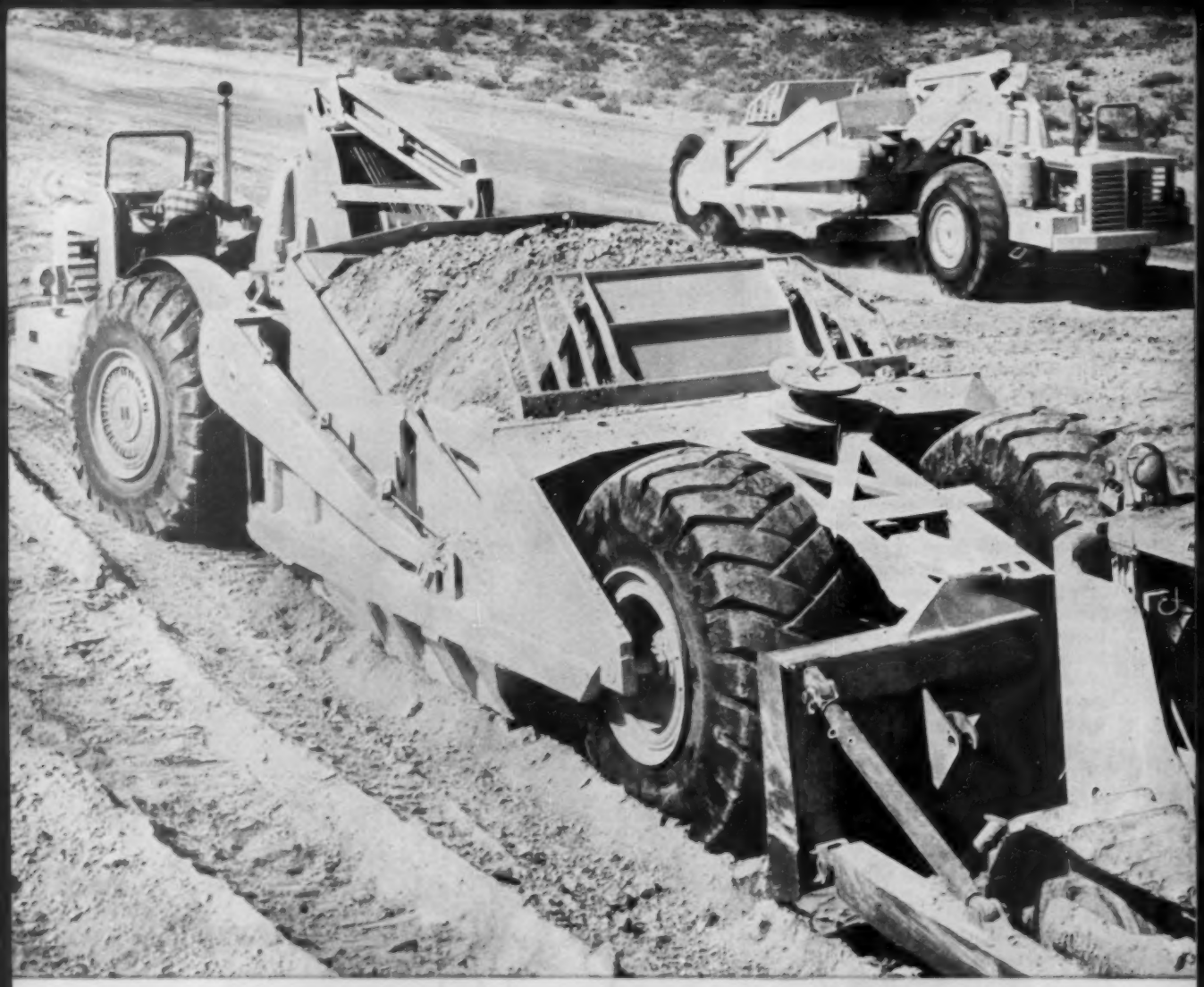
Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

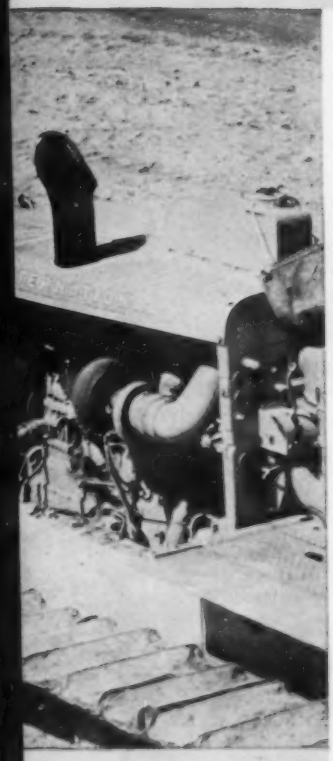
. . . for more details circle 283 on enclosed return postal card



With the planet-powered 230-hp TD-25 pushing—and with 375 high-torque International Diesel hp under the "295's" hood—you heap on 34-cu. yd. with amazing new speed. Even in toughest loading conditions, "X"-member reinforcing maintains perfect Payscraper push-frame alignment!

Note that the Payscraper apron lifts to a big 94-inch opening. Two ejector-plate pushing members apply dozer-like action to force out the whole 34-cu. yd. load cleanly. The 122-inch bowl width speeds unloading, and loading, too—adds control ease and stability, loaded or empty.

How Payscraper® power and power controls boost your dirt-on-fill delivery!



You get highest power-to-payload punch of all rubber-tired rigs in the 34-cu. yd. International 295 Payscraper. The fast-slugging, high-torque 6-cylinder International DT-817 Diesel is the Payscraper power plant.

The direct-start, 375-hp DT-817 is turbocharged to give you all-altitude, high-efficiency performance—power for cycle-speeding rim-pull—plus time-saving "no-lag" control power!

You power-shift the Payscraper, up or down—and the 4-speed planetary-type, torque-converter transmission provides load-speeding *automatic* direct-drive lock-ups in second, third, and fourth gears!

You power-steer the 150,000-lb. loaded Payscraper almost as easily as a 3,600-lb. automobile. Payscraper gives you the big control advantages of (1), exclusive International rack-and-pinion plus tandem pump steering system; and (2), 3-degree forward spindle pitch that improves scraper balance and prevents "nose-downs" in high-speed turns!

You power-control Payscraper dirt-handling actions with fingertip ease with the International PTO-driven Cable Control Unit. One cable drum of this simple planetary system actuates the apron and ejector; the other drum positions the bowl to control loading and spreading! Reach-easy Payscraper power brakes give you fast, positive stopping!

Ease into the bump-smothering Payscraper seat—press the direct-start button—power-shift the outfit into action. Compare the speed of loading, roading, and dumping the 122-inch bowl. See how the advantages of DT-817 Diesel power and complete, positive Payscraper power control can boost your dirt-on-fill delivery. Choose the 2-axle "295," or 3-axle, 34-cu. yd. "495." See your International Construction Equipment Distributor for a demonstration!

Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combination for top profits, *anywhere!* See your International Construction Equipment Distributor!

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE

Positive power-control of all operations adds safety, builds operator confidence — makes him "haul-speed minded" to help you get full capacity and profit from Payscraper speeds up to 33.5 mph. For example, safe, effortless tandem-pump power-steering leaves "the steering feel in the steering wheel"—gives positive, one-hand control!

Wide Use Seen for New A36 Steel

Saving of 4 to 6 percent in the weight of steel structures is promised by a new higher-yield-point structural carbon steel now available.

The new steel conforms to specification A36-60T for rolled structural steel recently approved by the American Society for Testing Materials. The A36 has a higher minimum yield point than present standard carbon structural steels. A spokesman of U.S. Steel Corporation predicts that the new steel will gain rapid acceptance and ultimately become the dominant steel used in structural applications.

Before adoption of the new A36, two other specifications for structural carbon steel have long been considered as standard in the heavy construction field. One, designated as ASTM A7, has for many years been generally used for bridges, buildings and other structural applications where load-bearing members are bolted or riveted. Its minimum yield point is 33,000 psi.

The other well-known carbon steel, ASTM A373 (32,000 psi) is used primarily in welded construction. The new A36 steel with minimum yield point of 36,000 psi hence has a 10 to 12 percent weight advantage over A7 and A373 on a straight strength basis. Also A36 compares favorably with A373 from a weldability standpoint according to U.S. Steel.

As an example of how this extra yield point strength can cut the weight of structures built with A36 steel, comparison is made with the older A7 steel in a typical I-beam bridge—one of the standard designs of the Bureau of Public Roads.

This bridge, a familiar highway-overpass type used to carry a 28-ft. roadway, spans 70 ft. It uses five 36 in. wide flange beams to support the roadway plus traffic. Total weight of the five beams is 86,670 lb. designed in A7 steel. This weight would be only 81,365 lb. designed in the new A36 steel. Overall saving in wide-flange beams: 5,305 lb. or 6.1 percent.

This saving is typical of that possible for spans of 20 to 70 ft. For buildings and other general structural applications estimated average weight savings would be about 5 percent.

Available forms of the new A36 steel include structural shapes, plates and bars in U.S. Steel's full product line now rolled to A7 and A373 specifications.

Traffic Institute Honors California, Michigan

The Institute of Traffic Engineers has honored the California and Michigan state highway departments "for maintaining a high level of performance in traffic engineering during 1959." In addition, 37 cities received awards.

Traffic planning, traffic control measures, traffic improvements and traffic engineering administration were among the items considered in making the awards. Nearly 800 cities and all states submitted entries. Awards were made on information reported in the Annual Inventory of Traffic Safety Activities by the National Safety Council.

PORTABILITY...
FOR PORTABLE PLANTS

Asphalt and Fuel Oil Storage and Heating
All In One Complete Portable Package

Childers All-In-One Portable Storage and Heating Units have proven themselves on the toughest jobs. They are maneuverable on all types of terrain, compact in design and highly portable. That's why Western Paving Construction Company in Denver and the Trinity County Road Department in California both chose an All-In-One to work in their rugged mountainous area. The operating efficiency and economy of Childers All-In-One Units assures savings on every job and their extreme portability greatly reduces moving expenses. An All-In-One can be custom-constructed to fit the asphalt and drier fuel oil storage and heating needs of any portable asphalt plant.

CHILDERS ALL-IN-ONE UNITS are Ideal for ANY PORTABLE ASPHALT PLANT OPERATION

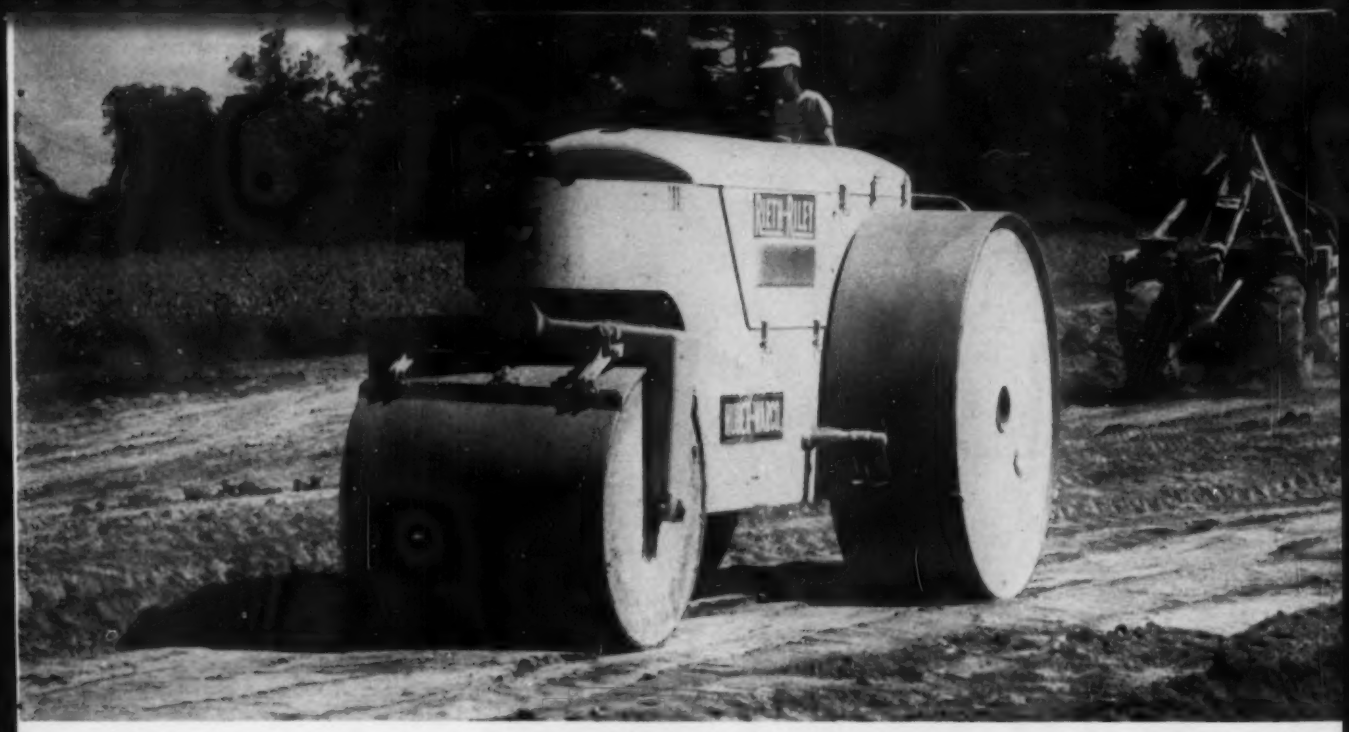
- Insulated Asphalt Storage
- Fuel Oil Storage
- Automatic Heating System
- Pumping and Unloading System (optional)

ALL-IN-ONE compact SEMI-TRAILER

CHILDERS
MANUFACTURING CO., INC.
P. O. BOX 6185
ALBUQUERQUE
NEW MEXICO

● Write for the address of the CHILDERS DISTRIBUTOR NEAREST YOU

. . . for more details circle 296 on enclosed return postal card



INDIANA—One of 5 Huber-Warco 3-wheel rollers owned by Rieth-Riley of Goshen, Indiana. It is compacting earth fill on a highway widening project near Richmond, Indiana. The company owns 25 Huber-Warco rollers.

HUBER WARCO

HUBER-WARCO *3 wheel rollers*

SIZES FROM 10 to 14 TON

Huber-Warco 3-wheel rollers are made in General Purpose, Finishing, and Variable Weight models to fit every 3-wheel roller need.

TORQUE CONVERTER tailshaft governor and two speed transmission are standard. Doubles available power, cuts fuel costs, increases life of machine components one-third to one-half.

SPECIAL SUB FRAME suspended at three points carries engine and transmission assembly and cushions outside shocks to increase machinery life.

GUIDE ROLL assembly has tapered roller bearings and is completely adjustable. Retains factory new adjustment indefinitely. Kingpin housing is removable.

OTHER FEATURES include replaceable tire design, differential lock, variable speed hydraulic steering, pressure sprinkling system, choice of gasoline or diesel engines.

A trusted product name backed by respected distributor names from coast to coast

MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.

TANDEM ROLLERS

3-5 Ton • 4-6 Ton Retractable • 5-8 Ton • 8-10 Ton • 8-12 Ton • 10-14 Ton

3-WHEEL ROLLERS

10-Ton • 12-Ton • 14-Ton Standard Weight 10-12 Ton • 12-14 Ton Variable Weight

MAINTAINER

M-52 — 45½ H.P. Attachments are Lift-Loader, Broom, Bulldozer, Patch Roller, Scarifier, Snow Plow, Berm Leveler

HUBER-WARCO COMPANY Marion, Ohio, U.S.A.

Limas charge batching plants for 120 different concrete mixes

"We use four Lima Type 34 Clamshells to charge concrete batching plants. It takes dependable high-output machines like the Limas to keep pace with the production of our modern concrete mixing operation. Our eight plants can produce 4000 yd. of concrete per 8-hour day. Seventy-seven radio controlled mixer trucks deliver customers a choice of 120 different mixes!

"Maintenance costs are very low—less than 4% of the purchase price of the machines" — *Harold H. Winterrowd, plant superintendent, Anderson Concrete Corp., Columbus, Ohio.*

For heavy duty rock digging, handling bulk materials, or whatever the job, there is a Lima best suited to the application. Shovels to 8-yd., draglines variable, 5-yd. front loader, and cranes to 140 tons on crawlers, 80 tons on rubber.

For reliable high production with low operating and maintenance expenses, you just can't beat Limas! That's because they are better designed and better built of better materials. In a word, Limas are *better* all around than competitive machines. And we can prove this to your satisfaction. For facts and figures, see your nearby Lima distributor or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Lima Austin-Western crushing, screening and washing plants for portable or stationary operation.

Lima Roadpacker for high-density subbase finishing in road and airport runway construction.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

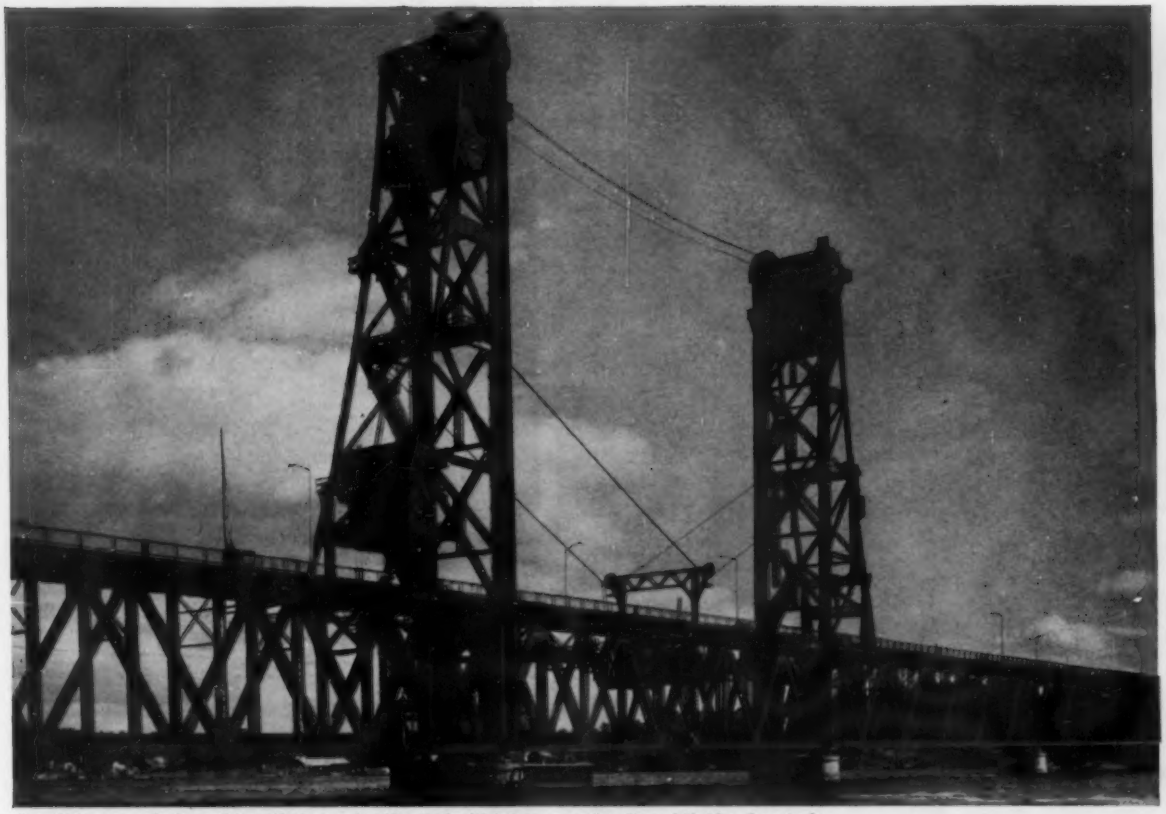
LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

6026

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON



It will be years before this mile-long, double-decked highway and railroad bridge has to be repainted. Every coat of the maintenance paint now being applied contains *M50* pigment.

Maine triple protects big Kennebec bridge with 3-deep, *M50*® "Defense-in-Depth" paint system

Did you know that you can now buy metal protective paints with anti-corrosion pigment in *all three coats* . . . primer, intermediate *and* finish?

Did you know that these "Defense-in-Depth" paints are so durable that primers alone . . . with no intermediate or finish coats to protect them . . . have endured *years of exposure?*

A relatively new pigment, *M50*® *basic lead silico chromate*, permitted development of these outstanding new-type metal protective paints.

And how they've caught on!

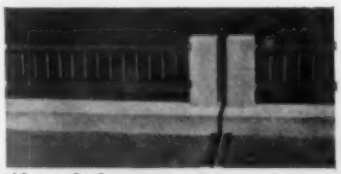
In October, 1956, Maine painted a small highway bridge in Minot's Corner with *M50* "Defense-in-Depth" paints. Small photos show you how that paint job looked in August, 1959.

Now Maine is giving its mile-long double-decked, Kennebec Bridge in Bath the same *M50* pigment 3-deep protection. Old surface is brush blasted then given an *M50* spot prime and an *M50* intermediate coat where needed. Final step is the application of 2600 gallons of an *M50* green finish coat.

As Maine goes...

. . . so goes the nation. State after state is completing its early tests of *M50* "Defense-in-Depth" paints and has big *M50* bridge maintenance painting jobs under contract or advertised for bids . . . Georgia, Missouri, New York, South Carolina. And many more to follow suit.

Your regular paint suppliers can make *M50* "Defense-in-Depth" paints. Ask them. For technical details on *M50* pigment itself in metal protective paints, write National Lead Company.



Above decks . . .

Below decks . . . First Maine bridge to be painted with *M50* "Defense-in-Depth" paints remains free of film defects. Bridge, at Minot's Corner, was painted 34 months before pictures were taken.

M50 an **oncor**® *Pigment...A Development of*

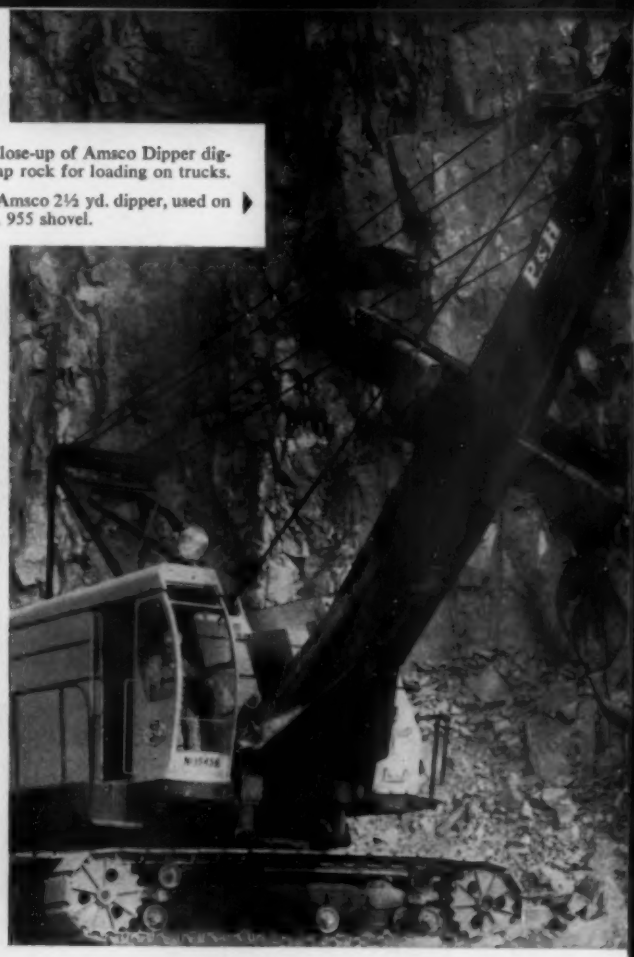
National Lead Company

General Offices: 111 Broadway, New York 6, N.Y.

. . . for more details circle 334 on enclosed return postal card

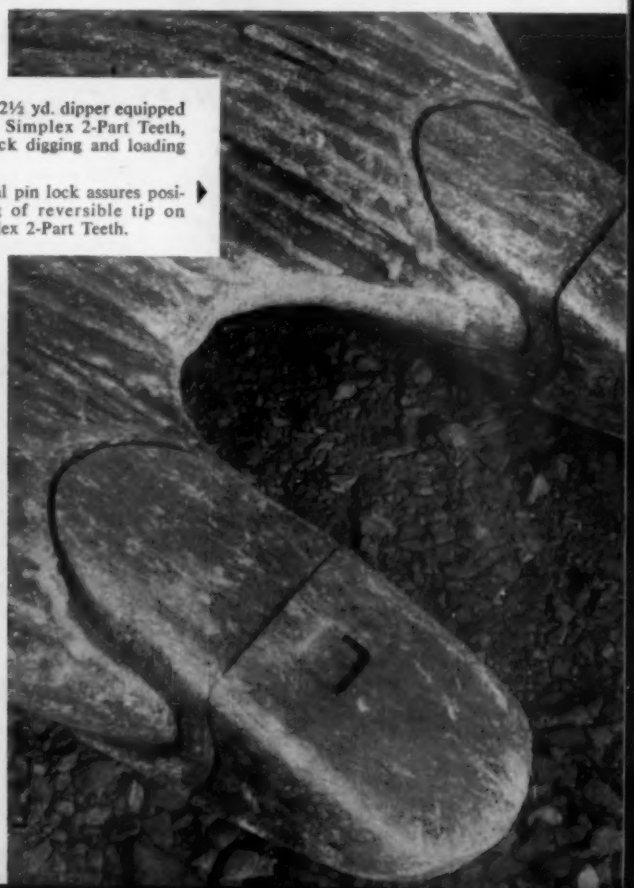
Left: Close-up of Amsco Dipper digging trap rock for loading on trucks.

Right: Amsco 2½ yd. dipper, used on P. & H. 955 shovel.



Left: Amsco 2½ yd. dipper equipped with Amsco Simplex 2-Part Teeth, used for rock digging and loading at quarry.

Right: Special pin lock assures positive locking of reversible tip on Amsco Simplex 2-Part Teeth.



More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

Read about the actual experience of a large New England quarry with Amsco Dippers and Simplex 2-Part Teeth*

"WE HAVEN'T WORN OUT AN AMSCO DIPPER IN 5 YEARS"

This, in the words of the quarry superintendent, sums up his experience with Amsco Manganese Steel Dippers. It's rugged work, all in rock, as you see from the pictures at the left. Shovel and dipper are used to load trap rock onto trucks for transportation to the crushing plant.

The Amsco Dipper was installed because the superintendent had used them before, and knew their reputation for long life under tough digging conditions. Experience is proving him right . . . again.

SIMPLEX TEETH HANDLE 25,000 YDS. OF ROCK BEFORE REPLACEMENT

At this same quarry, Amsco Simplex 2-Part Teeth are giving 120 hours' service... handling 25,000 to 30,000 yards of rock... before replacement is necessary. That's considerably longer service than has been obtained from competitive 2-part teeth, the quarry superintendent states.

Not only is the wear-life of these teeth exceptional, but operators like the ease of replacement, and the fact that the tips stay on without trouble.

For further information on Amsco Dippers or Simplex 2-Part Teeth, see your power shovel equipment dealer, or write to Amsco for technical bulletins showing sizes, types and application data. *Patent No. 2,904,908.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

. . . for more details circle 279 on enclosed return postal card

LOOK WHAT THEY'RE DOING WITH DEEP STRENGTH ASPHALT PAVEMENTS IN WESTERN KANSAS!

To withstand heavy traffic,
sizzling heat, numbing cold...

11-inch sand-Asphalt base is chosen for Kansas Interstate 70

Traffic will soon be rolling on a new DEEP STRENGTH Asphalt pavement section of Interstate 70 in Trego County, Western Kansas. In this part of the country, temperatures range from a numbing 20 below zero in winter, to sizzling 115°F in summer; winds sometimes reach hurricane force.

To meet the demands of expected heavy traffic and extreme weather, Kansas Highway Commission Engineers chose DEEP STRENGTH Asphalt pavement. Notice construction and cross-section (below). See how precepts of the new DEEP STRENGTH Asphalt design are incorporated . . . heavy-duty, **full width** Asphalt Concrete surface . . . **11-inch heavy-duty, sand-Asphalt base** . . . heavy compaction . . . good drainage. Here is strength and durability!

Minimum Maintenance

When built like this—for DEEP STRENGTH—Kansas experience has shown that Asphalt pavement will carry the heaviest traffic loads *without* distress and *with minimum maintenance*.

Make Best Use of Road-building Dollars

Like many other states, Kansas is finding that when Interstate highways are built with Advanced Design DEEP STRENGTH Asphalt pavements, the best use is made of road-building funds. For the Advanced Design Criteria for Asphalt pavements often save money over the cost of Asphalt pavement designed to other standards. The reason is the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

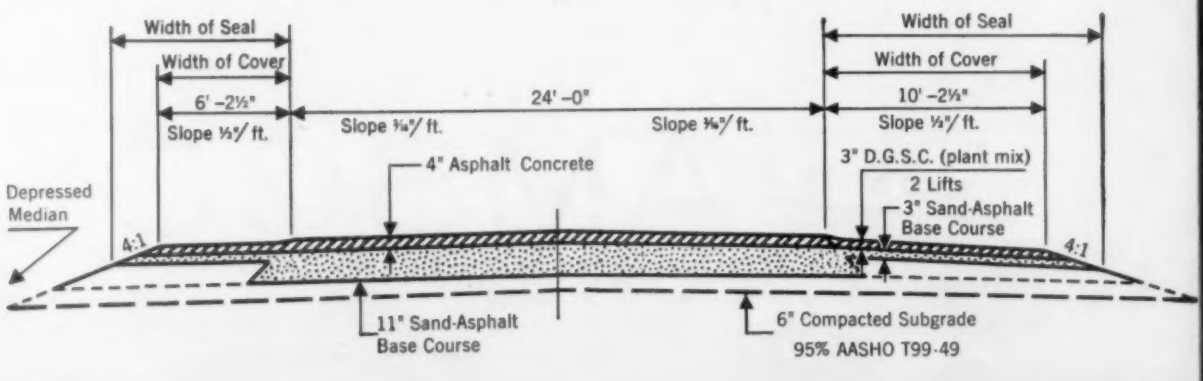
New Handbook

A new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt pavement is now available at the Asphalt Institute office serving your area.

THE ASPHALT INSTITUTE

ASPHALT INSTITUTE BUILDING, COLLEGE PARK, MARYLAND

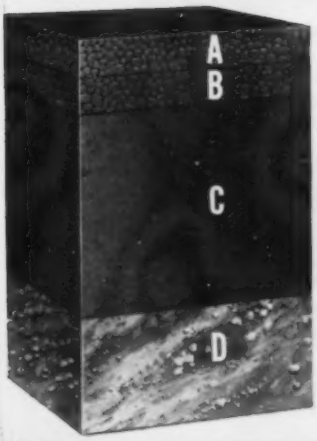
TYPICAL PAVING SECTION



Subgrade was compacted and fine graded before road-mixing of sand-Asphalt base.

Local sand shaped in windrow, bladed to reduce moisture to less than 1%, reshaped into windrow, mixed with Asphalt through traveling mixer—aerated and compacted.

Supporting courses are compacted with high contact pressure pneumatic roller to assure smoother riding under all traffic weights to come. Contractor's equipment was permitted on base course during construction of successive layers, which assisted in obtaining maximum density and reducing haul costs.



THIS IS DEEP STRENGTH CONSTRUCTION

A
2-inch surface course

B
2-inch binder course

C
11-inch
sand-Asphalt base

D
Subgrade

NEW

GILSON

Porta-Screen™

PORTABLE TESTING SCREEN

Motor or hand driven.
Samples up to 25 lbs.
1½-in. to 200-mesh

OPERATES free-standing on any surface; or bolted to a semi-permanent location; or on bare ground (with retractable spiked feet). DISMOUNTS in two portable sections.

USE *Porta-Screen* for:

- ★ field inspection and testing
- ★ ready-mix concrete plants
- ★ black-top plants
- ★ concrete products plants
- ★ small aggregates plants
- ★ lightweight aggregates
- ★ ores and minerals
- ★ mass separation for research
- ★ screening under direct wash water

Porta-Screen *is made by the makers of the time-tested GILSON Testing Screen, the GILSON Sample Splitter, and other size-testing equipment and accessories.*

WRITE FOR LITERATURE

GILSON SCREEN CO.
MALINTA, OHIO

. . . for more details circle 308 on enclosed return postal card

Tractor Shovel Handles De-Icing Materials

The new Minneapolis-Moline 59 hp crawler tractor, called the MoTrac, is shown loading 1¼-yd. bucket of sand-salt mixture for Minnesota's icy roads in late spring. Productivity is aided by five forward and five reverse speeds, fast reverse, torque converter and instantaneous full-power "heel-and-toe" reversing shuttle.

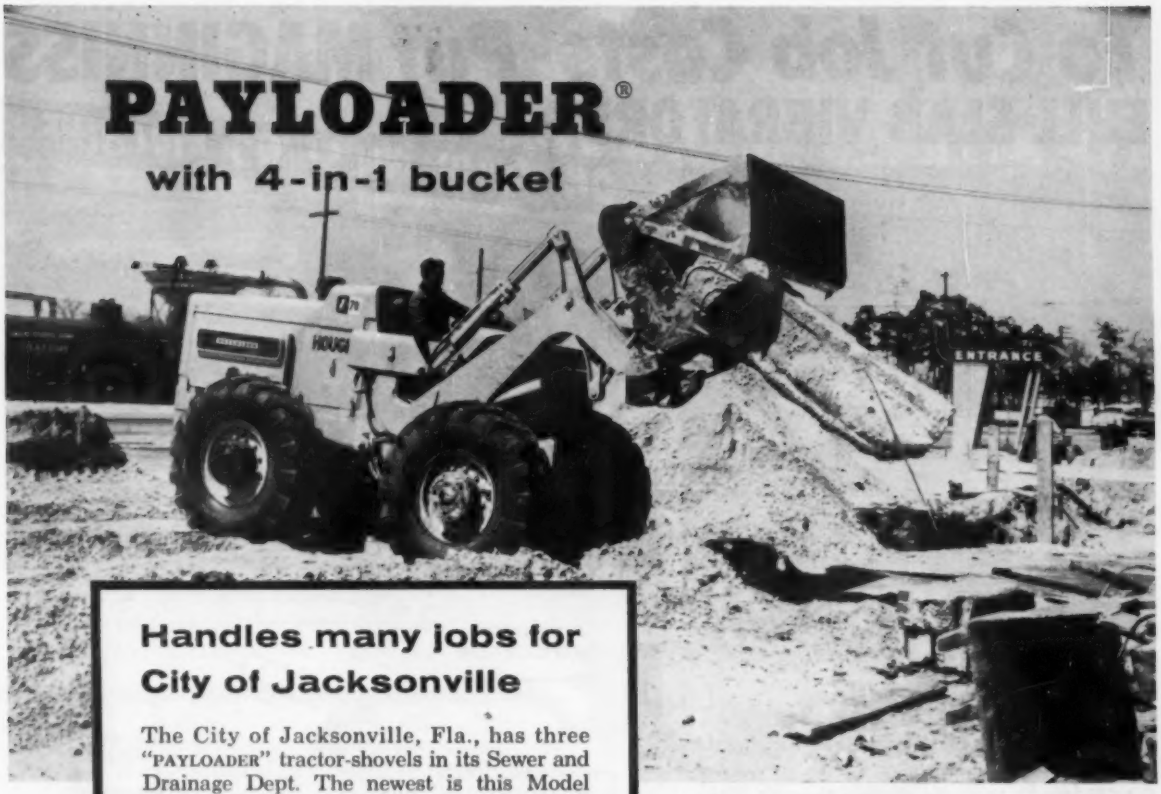
Long Reach Crane Aids Structure Work

An example of how the new long-boom cranes are bringing changes to many job methods is pictured here. This happens to be a sewage plant project, the new North Side Treatment Works in Chicago. A P&H 1015 crane with 200-ft. boom is used here with a 1-yd. bucket to pour concrete walls involving a reach as great as 170 ft. It takes only a little figuring to underscore the job advantage afforded by this reach, which permits arcing over a very large expanse of work from a single crane position.

Contractors J. S. Simmons Co., of Chicago used a 2½-yd. concrete bucket for closer pours, and a smaller P & H truck crane for moving forms and doing other handling including spotting loads for the larger machine.

The Model 1015 crane is the one which, the makers say, can handle the longest boom of any mobile crane; up to 250 ft. boom with 50 ft. jib as routine.

P&H crawler crane, capable of the world's longest reach is reducing costs in building new sewage treatment facilities for Chicago.



Handles many jobs for City of Jacksonville

The City of Jacksonville, Fla., has three "PAYLOADER" tractor-shovels in its Sewer and Drainage Dept. The newest is this Model H-70 equipped with Drott 4-in-1 bucket. How useful and indispensable this combination can be in any city's equipment pool was demonstrated on this project.

The job involved relocation of 700 feet of 15" terra cotta sewer in preparation for a new expressway. The "PAYLOADER" with its multiple-action bucket grasped and loaded out large chunks of concrete pavement, curbing and sidewalks, loaded out excess material, pulled sheet piling, backfilled the trench, and handled many other chores all over the job.

When you buy a "PAYLOADER" you get *more* than a tractor-shovel. You get the most *proven* and the most *useable* of machines because of the most complete and unusual selection of attachments ever made available for any tractor-shovel.

The 4-in-1 bucket, front or rear-mounted back-hoe, bituminous spreader, side-boom, pick-up street sweeper, leaf-loader, rotary, "V" and blade snow plows are all available to make your "PAYLOADER" a one-machine equipment pool. And there's a proven "PAYLOADER" type and size for any size municipality.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.

The Powerful hydraulic clam action of the 4-in-1 bucket quickly grasps, moves and loads large, awkward pieces of old concrete.

With clam lip raised, the "PAYLOADER" becomes an efficient bulldozer.

THE FRANK G. HOUGH CO.
768 Sunnyside Ave., Libertyville, Ill.

☐ Send bulletin "more mileage for your tax dollar"

Name

Title

Gov't Unit

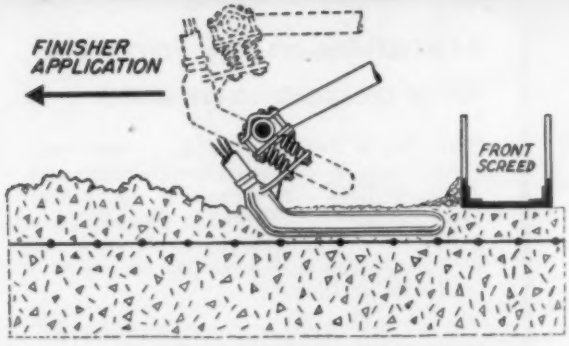
Street

City State

R-8-3

. . . for more details circle 315 on enclosed return postal card

To Cut Job Costs - Put MAGINNISS FULL SLAB VIBRATORS - ON YOUR FINISHING MACHINE



Increase production 20%

Hundreds of paving contractors are eliminating the second pass of the finisher—and often the need of a spreader—by using MAGINNISS Hi-lectric Vibrators on their finishing machines. Operating completely immersed in the concrete, Hi-lectric vibrators speed distribution, leave surface semi-finished, increase production up to 20%. You can bid lower—and IMPROVE quality of concrete—by using MAGINNISS Hi-lectric internal vibration.

Easy mounting

Quickly mounted on any finisher or spreader. No auxiliary carriage required. All attachment parts are furnished complete.

Minimum labor

The finishing machine operator controls all positioning of vibrator, on and off, and the vibration speed to suit consistency of concrete and other job conditions. Vibrators are raised and lowered by double-acting hydraulic cylinders powered by the hydraulic system of the finishing machine.

Eliminate honeycomb throughout slab

Angle positioning of vibrators below surface of slab obtains most efficient results possible—assures a UNIFORM homogeneous mixture of aggregate and mortar from base to surface. MAGINNISS Hi-lectrics easily handle the stiffest concrete mixes.

Packed with power—built to last

Hi-lectric Vibrators have only TWO moving parts. No brushes, commutators, gears, flexible shafts, nor complicated air or fluid drive mechanisms to require costly repair or replacement. Because the induction motor is located in the vibrator head, it is cooled by the surrounding concrete.

WRITE FOR COMPLETE INFORMATION—or call your nearest MAGINNISS Distributor. He's listed under "Contractors Equipment" in 85 principal cities.

Find your nearest distributor in the 'Yellow Pages'

Maginniss HI-LECTRIC VIBRATORS

MAGINNISS Power Tool Company

Dept. RS-30, 154 Distl Avenue, Mansfield, Ohio

. . . for more details circle 329 on enclosed return postal card

UNIFORM COMPACTION WAY DOWN DEEP

Exclusive with Yuba-Southwest Compaction Rollers: Independent oscillation gives constant wheel load — regardless of soft spots or boulders.

You'll find a flexibility and much greater compaction uniformity over conventional single box type rollers in the patented design now available in Yuba-Southwest Multiple-Box Rollers.

The amazing amount of work these units will do has been thoroughly proved by tests under all earthfill conditions. Uniform compaction of heavy or soft lifts, regardless of rocks, is accomplished with fewer passes and with greater efficiency than by any other tamping method. A major design feature is in the individual weight boxes and wheels: each assembly is mounted independently for full vertical oscillation, providing a constant wheel load no matter what the terrain. Bridging or load shifting is eliminated, and the Yuba-Southwest Multiple-Box Roller rides slopes smoothly with greatest possible stability.

You get up to three times as much tire life, too, over single box type rollers with their limited oscillation. Costly overwear and frequent blowouts are a thing of the past.

Why not get full information on this outstanding, money-saving equipment today. Choose from five models: 10 to 100 tons rated capacity. Adaptable to any job. Assembled in any combination of 3 to 6 boxes with flanged yoke.

Yuba-Southwest also manufactures
SEMI-TRAILER SPRINKLER TANKS
SELF-PROPELLED ROLLERS
SHEEPSFOOT ROLLERS

Sold and Serviced by Your Caterpillar Dealer

YUBA

specialists in compaction equipment

SOUTHWEST WELDING & MANUFACTURING DIVISION
3201 W. Mission Road, Alhambra, California
YUBA CONSOLIDATED INDUSTRIES, INC.

. . . for more details circle 354 on enclosed return postal card

"'Live track' power steering rock...SO WE KEEP OUR TD-25

—Asheville Contracting Company,

Shale and blue granite rock make up 85% of the 550,000-cu. yd. of roadway excavation on this contract —5.18 miles of Blue Ridge Parkway construction, for the United States Department of Interior.

That's why Asheville Contracting Company places maximum reliance on their "rock-movers' special": king-sized International crawler power! Where the going's too tough or job progress is too slow and costly with big clutch-steered crawlers, "Asheville's" new 230-hp TD-25 and two veteran TD-24's take over—and "run interference."

"International 'live track' power steering moves more dirt and rock," states M. H. Reighard, Superintendent of rock operations for "Asheville." "Therefore, we keep our TD-25 and TD-24's on trail-blazing and pioneering. The 'live track' feature keeps the blade in the material and makes steep work safer. TD-25 balance enables working 'almost straight up' on mountainous terrain."

Exclusive, years'-proved International Planet Power-steering gives you full-time live power on both tracks to handle full loads on turns as well as straightaways. Load-limiting "dead-track drag" is eliminated. And

moves more PIONEERING"

Asheville, No. Carolina

"live track" power-steering is combined with on-the-go, Hi-Lo power-shifting that lets you match power to load instantly, for full-speed cycles. You do away with time-wasting "gear-shift lag!"

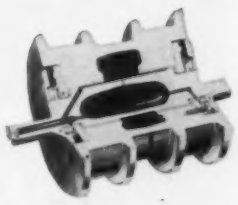
New TD-25 seven-roller tracks are strength-matched to the full effort of the high-torque, 230-hp turbo-charged Diesel engine! The "25" is platformed on shock-resistant, double-box-beam track frames—smoothly carried on International's dual-protected Dura-Rollers, the track rollers that make 1,000-hr. lube intervals practical!

As standard equipment at no extra cost, the TD-25 gives you exclusive, combined Planet Power-steering and Hi-Lo on-the-go power-shifting. And you get this work-speeding design advantage in torque-converter or direct drive model. Here, Asheville's "25" operator is ready to "shift-up" to keep the load on the move.

Power-steer and power-shift the TD-25 with king-sized loads—around curves, upgrade, anywhere! Compare planet-powered "25" ability to deliver full-load capacity, full-time—to outearn other big rigs up to 50%—blading rock, benching, push-loading, mass-production dozing (where fast reverse and decelerator action count), ripping shale! Let your International Construction Equipment Distributor demonstrate!

Even with an enormous offset load of shot-rock there's no "bank-nosing;" no sluing. The TD-25 operator simply operates the load-side track in high-speed range—the other track in low-speed range. Result: full-capacity, straight-ahead performance—the same as the "25" gives on benching, bank-cutting, or side-casting!

Heavy-duty TD-25 Dura-Rollers feature thick, deflection-proof shells; full-floating, precision fitted seals; king-sized lube reservoirs; and exclusive pressure-relief passages that protect seals from overlubrication. These minimum-maintenance track rollers give you practical 1,000-hr lubrication intervals!



International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

GALION®

Vibratory Compaction...

UNITS

With the GALION 3-WHEEL ROLLER VIBRATORY COMPACTOR combination, you not only attain specified densities of granular materials, but you also can achieve effective compaction of the many soils which respond best to a static weight roller. In addition, the 3-Wheel Roller can be used for the compaction of finish surface materials. This multi-purpose usage multiplies the profit possibilities on your roller investment.

•

With the GALION Model 503 GRADER-VIBRATORY COMPACTOR combination it is possible to spread, level, and compact the material — all in ONE operation or separately as the situation may demand. The vibrating unit is raised hydraulically for speedy travel on, to and from the job. The profit possibilities of this combination are not limited to one function. Vibrating Compactor unit is easily removed to permit other grader operations such as ditching, blading, windrowing, etc.

With the GALION Grader or Roller and Vibratory Compactor combination you SAVE — on equipment cost, labor costs, operating costs and overhead costs.

doubly useful- doubly profitable

ELECTRIC VIBRATORY COMPACTOR FEATURES

- Delivers up to 4200 three-ton, deep-penetrating compacting blows per minute.
- Vibratory Compactor can be operated with Roller or Grader traveling forward or reverse.
- Compacted surface is smooth and flat—no waves or "washboard" effect.
- Roller and Grader are protected against vibration of the compactors which FLOAT on the surface.
- Power unit (engine and generator) for compactor can be used as an emergency lighting plant or for the operation of small power tools.
- Individual compactor shoes can be detached and fitted with operating handle for compacting confined spots others can't reach.

THE GALION IRON WORKS & MFG. CO.

General and Export Offices

Galion, Ohio, U.S.A.

Cable Address—GALIONIRON, Galion, Ohio

GALION® ESTABLISHED 1907 **MOTOR GRADERS • ROLLERS**

VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS

THE GALION IRON WORKS & MFG. CO. Date_____

Dept. R-90 Galion, Ohio

Please send me complete information on ☐ 3-Wheel Roller with Vibrator ☐ Model 503 Grader with Vibrator

Name_____ Title_____

Firm or Dept. _____

Street_____ City_____ State_____

. . . for more details circle 307 on enclosed return postal card

Contractors and Cost Keeping

Contractors seem to be a breed apart in many respects, and the old tag of "rugged individualists" still fits many of them. In the highway and heavy construction field today you see contracting companies ranging from corporate giants to one-man operators with office on a dozer seat. The industry is still growing up.

Nowhere does the individualism show up more persistently than in cost keeping or the lack of it. This point is brought out in the exchange of letters published in this issue. These letters consist of an appeal (source camouflaged) addressed to James P. apRoberts, together with his reply. Mr. apRoberts is the author of the series of articles on Constructive Cost Controls runing recently in Roads and Streets. The young accountant who wrote apRoberts consulted him in his zeal to advance as a specialist in highway contractor cost accounting. He complains that road contractors, in particular, don't seem to favor a free exchange of experience in the cost keeping art but remain secretive.

Of course there are areas of activity within any company which are strictly private. Cost *data* naturally will be kept under lock and key. Figures on the cost of performing work, based on a firm's hard-won experience, are rightly played close to the vest.

But *data* should not be confused with *procedures.* Contractors need to utilize the best procedures. And more importantly, they need to fit cost accounting into an important place in the company's organization chart, with the entire staff from the president down to the clerk in the field office appreciative of the importance of the cost keeping function and their part in it.

The letters published in this issue are worth reading and pondering by contractor men concerned with the business end of their companies. Better utilization of cost keeping as a management tool will make for better job management efficiency and economy. Contractors are quick to try new ideas. They can be just as quick in determining which new ideas are cost cutters and which are shirt losers. Fewer contractors would bid below their costs, fewer would go broke, if cost control methods were more freely and systematically disseminated.

A free exchange of cost methods and experience won't hurt the individual contractor, and it will help develop the new crop of better qualified cost men that the whole industry needs.

Harold J. McKeever

The east portal under Grand Concourse. Tunnel is largely completed except for the portal facing and paving. Tunneling had to be synchronized with approach excavation, building underpinning and wall construction. ➔

Short Tunnel —But a Tough One

Expressway tunnel in New York City designed for tight headroom. Blasting restrictions figured in the methods used

By Walter Zalits, P. E.,

Associate, Shumavon & Buckley,
Consulting Engineers, New York, N. Y.

One of the most costly segments of expressway currently under construction in New York City is the 0.6-mile leg of the Cross-Bronx Expressway. This is the new artery that will connect between George Washington Bridge and Bruckner Boulevard Expressway to the east. Johnson, Drake & Piper, Inc., has the $9,330,000 contract for this short segment between Anthony and Jerome Avenues, at an equivalent cost of $15.5 million per mile of 6-lane depressed expressway.

The most unusual feature of this contract is the roadway tunnel under the Grand Concourse. The 174th Street Station of the Independent Subway System also lies over this tunnel at an intermediate level.

This structure is quite different from the ordinary tunnel. When finished it will be 89 ft. wide and 304 ft. long. The actual width of excavation is 95 ft. The tunnel roof was designed as a horizontal rather than arched structure so as to keep the height of the excavation to minimum of 22 ft. This was necessitated by the proximity of the subway foundations and station mezzanine which are only 15 ft. above the tunnel roof.

The primary load supporting members of this structure are low-alloy steel bents (ASTM A 242) spaced 3 ft. apart. Each bent consists of three rolled steel 14 WF columns of weights varying between 142 and 314 lb. per ft., and of two riveted plate girders 5 ft. deep. Field connections were made with high-strength bolts, The columns were erected on concrete footings placed against rock, and the base plates were dry packed after the columns had been connected to the girders.

The finished bents were encased in 1:2:3½ concrete on all sides, except the bottom flanges of the girders and the inner flanges of the columns which will remain exposed in the finished structure.

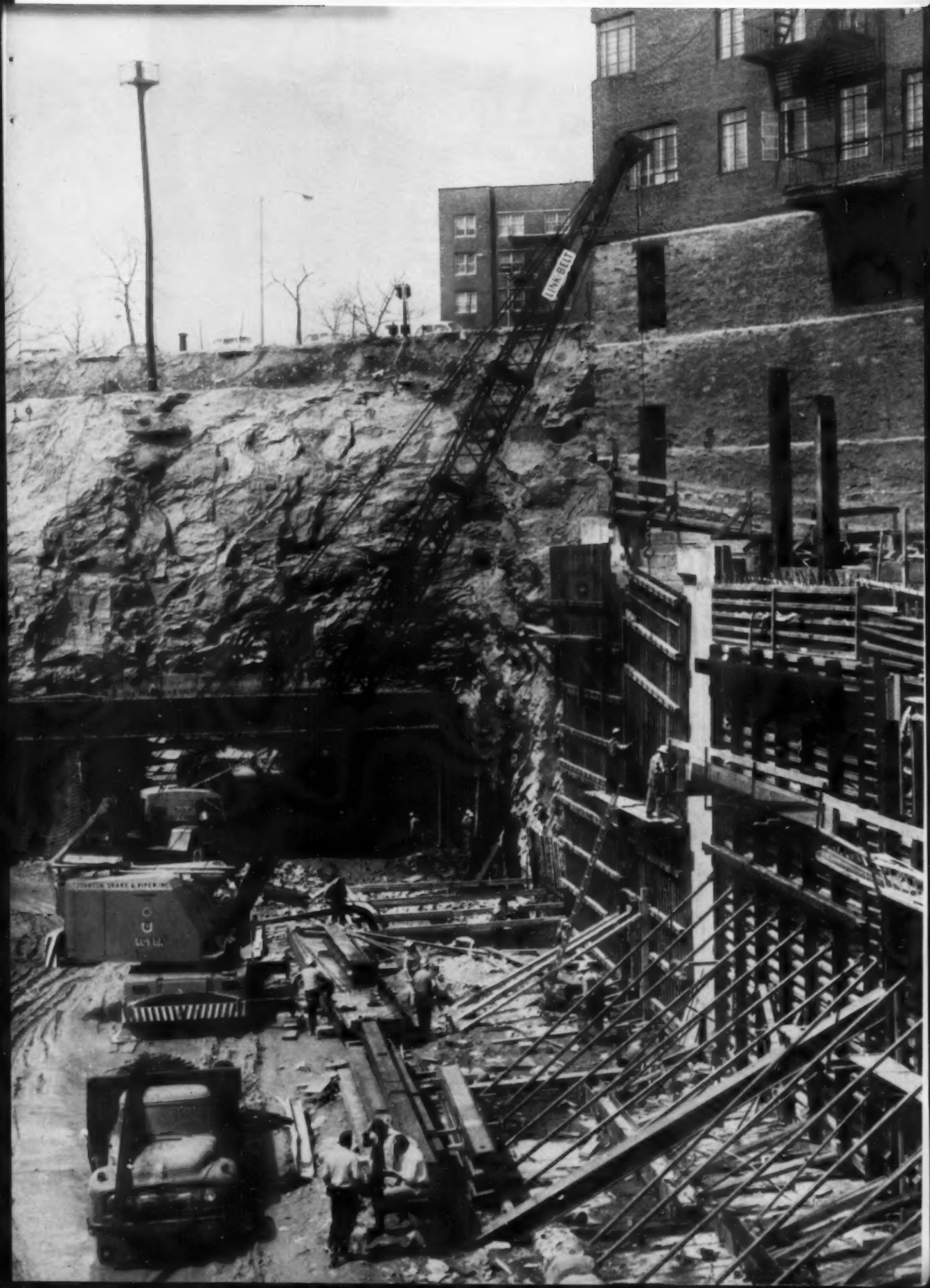
The structure will be finished inside with a glazed terra cotta facing on the walls between the column flanges, and the ceiling and exposed steel will be painted.

The concrete pavement will be separated from the structural work. The tunnel will require no mechanical ventilation but will be lighted 24 hours a day.

The low-alloy steel bents were designed to carry the entire super-imposed rock load in addition to the weight of the steel and concrete. No composite action between steel and concrete was figured in the design. The function of the concrete was to transmit and distribute the rock load to the steel bents, to brace the steel against all horizontal movement and to make the structure watertight.

Construction of even this short a tunnel had its problems. The subway directly above the tunnel was in full operation at all times and no interference with the subway traffic was permitted, other than stopping the trains beyond the work area at the actual time of blasting. As trains could be stopped only during hours of low train traffic volume, no blasting was permitted during morning and evening rush hours.

In view of the unusual width of the excavation, and of the scant amount of cover, it would not have been possible to excavate the full tunnel face at one time. In order to determine the condition of the rock, an


LINK-BELT

West portal late winter with tarpaulins for sheltering workers. Note steel H-beams bolted to the gneiss rock to hold it until after the reinforced concrete portal wall has been constructed. At right, Eimco mucking shovel used in the tunnel.

exploratory pilot drift 11 ft. wide and 9 ft. high, located in the upper center of the cross section, was excavated for the full tunnel length. The rock was found to be mostly gneiss, somewhat blocky due to diagonal seams.

After the pilot drift had been holed through, the north half of the main tunnel was started from both portals. In order to safeguard the subway structure in which normal train schedules were maintained, the specifications required that the steel bents be set and concrete lining be placed directly behind the excavation, the distance between the excavation heading

perienced in placing the concrete footings and erecting the steel bents as per schedule. The placement of the lining concrete, on the other hand, proved to be impractical due to the close proximity of the heading. First, although the steel bents eliminated the need for most of the form work, the forming between the girders presented difficulties. The forms could not be supported on posts from the ground, as these were too vulnerable during blasting and obstructed access to the heading.

An attempt was made to clamp form supports to the edges of the bottom flanges of the girders. This [illegible] to be unsatisfactory due to the

Constructive Cost Controls for Contractors
One of a Series

Contractor's Young Cost Accountant Asks Pointed Questions

Editor's Note: Mr. J. R. U. Learning, of Bidright, Contractors (names camouflaged), is one of a good many readers who have written in as a result of the articles by James P. apRoberts on Constructive Cost Controls for Contractors. (Article No. 5 in this series appeared in June Roads and Streets. No. 7 will run in October). Published in full here is Mr. Learning's provocative letter together with Mr. apRoberts' reply. See also the editorial in this issue on this subject, on which several leading contractors have concurred with us as being of major importance to the individual contractor and to the industry.

Mr. James apRoberts
Cost Control Specialist
La Canada, California

Dear Mr. apRoberts:

I have been following your cost series in Roads and Streets with great interest. Because I am very new in the construction business (only 3 months) these articles have already assisted me in numerous ways. I am looking forward to many more interesting articles from you.

The firm I am working for had a construction consultant come in recently and establish a cost system. Like many small contractors, Mr. Bidright has most of the figures in his head. Within the last three [illegible] five years of cost experience in another industry. But there is a terrific difference between that industry and construction. After considerable discussion with Mr. Bidright and the consultant, I agreed to join the firm.

Trying to learn the construction business, the new cost system and the accounting set-up does present problems. I have tried, without sucess, to set up some meetings with other cost men in construction, to discuss systems and problems of cost accounting for contractors. The manager of my state's AGC Chapter has been very helpful but not one contractor within the [illegible] state will go along with the idea.

There should be an exchange of knowledge in this field as in others. Then, if we can see where various methods might be coordinated into our own systems, to do so. Naturally my reasons are selfish. I'd like to learn as much as possible in a very short time so that I can do a respectable job for Mr. Bidright.

At present, I feel very inadequate, and am trying to find sources of information for construction account and cost control. My company has two reference books: Practical Accounting and Cost Keeping, by F. R. Walker Co.; and Construction Accounting and Financial Management, by William Coombs (F. W. Dodge Corp.) A.I.C.P.A. has a very interesting new pamphlet

West portal late winter with tarpaulins for sheltering workers. Note steel H-beams bolted to the gneiss rock to hold it until after the reinforced concrete portal wall has been constructed. At right, Eimco mucking shovel used in the tunnel.

exploratory pilot drift 11 ft. wide and 9 ft. high, located in the upper center of the cross section, was excavated for the full tunnel length. The rock was found to be mostly gneiss, somewhat blocky due to diagonal seams.

After the pilot drift had been holed through, the north half of the main tunnel was started from both portals. In order to safeguard the subway structure in which normal train schedules were maintained, the specifications required that the steel bents be set and concrete lining be placed directly behind the excavation. The distance between the excavation heading and the fully concreted tunnel lining was specified not to exceed 16 ft. at any time. The contractor prepared his schedule of operations in conformity with this requirement. The schedule called for advancing each heading in 6-ft. increments, which permitted setting of two steel bents 3 ft. apart at a time. This was to be followed by placing a 6-ft. length of the concrete tunnel lining. The complete cycle of each 6-ft advance was to be completed within 48 hours.

The excavation, carried along by the bench and heading method, could be advanced in accordance with the schedule. Likewise, no difficulties were experienced in placing the concrete footings and erecting the steel bents as per schedule. The placement of the lining concrete, on the other hand, proved to be impractical due to the close proximity of the heading. First, although the steel bents eliminated the need for most of the form work, the forming between the girders presented difficulties. The forms could not be supported on posts from the ground, as these were too vulnerable during blasting and obstructed access to the heading.

An attempt was made to clamp form supports to the edges of the bottom flanges of the girders. This method turned out to be unsatisfactory due to the large head of liquid concrete.

The forming difficulties were finally resolved by the use of precast concrete slab sections. These were set in a mortar bed to rest on the bottom flanges of the girders. The slabs were left in place to become part of the permanent concrete tunnel lining.

A second obstacle arose in placing the concrete directly behind the heading in accordance with the original schedule. That was the unknown effect of the blasting on concrete at early ages. It could not be

Continued on page 147

Constructive Cost Controls for Contractors
One of a Series

Contractor's Young Cost Accountant Asks Pointed Questions

Editor's Note: Mr. J. R. U. Learning, of Bidright, Contractors (names camouflaged), is one of a good many readers who have written in as a result of the articles by James P. apRoberts on Constructive Cost Controls for Contractors. (Article No. 5 in this series appeared in June Roads and Streets. No. 7 will run in October). Published in full here is Mr. Learning's provocative letter together with Mr. apRoberts' reply. See also the editorial in this issue on this subject, on which several leading contractors have concurred with us as being of major importance to the individual contractor and to the industry.

Mr. James apRoberts
Cost Control Specialist
La Canada, California

Dear Mr. apRoberts:

I have been following your cost series in Roads and Streets with great interest. Because I am very new in the construction business (only 3 months) these articles have already assisted me in numerous ways. I am looking forward to many more interesting articles from you.

The firm I am working for had a construction consultant come in recently and establish a cost system. Like many small contractors, Mr. Bidright has most of the figures in his head. Within the last three years his business had doubled, with a present annual volume of about $1,200,000. There were just too many figures, plus the fact that there never was a cost system.

The consultant advised Mr. Bidright to get a cost accountant. Having known Mr. Bidright for some years, and being a cost man, I was approached by him. I am only 28 years old with a B.S. degree in Business Adminstration and have five years of cost experience in another industry. But there is a terrific difference between that industry and construction. After considerable discussion with Mr. Bidright and the consultant, I agreed to join the firm.

Trying to learn the construction business, the new cost system and the accounting set-up does present problems. I have tried, without sucess, to set up some meetings with other cost men in construction, to discuss systems and problems of cost accounting for contractors. The manager of my state's AGC Chapter has been very helpful but not one contractor within the whole state will go along with the idea.

I was very happy to see you mention this point in your June article. This may break a few barriers down and start my state's contractors thinking. The problem seems to be that everyone thinks one is trying to learn his internal operation to out-bid him. I may be using the wrong approach on this but I feel that we, as accountants, should find out what methods other firms are using and have proven successful. There should be an exchange of knowledge in this field as in others. Then, if we can see where various methods might be coordinated into our own systems, to do so. Naturally my reasons are selfish. I'd like to learn as much as possible in a very short time so that I can do a respectable job for Mr. Bidright.

At present, I feel very inadequate, and am trying to find sources of information for construction account and cost control. My company has two reference books: Practical Accounting and Cost Keeping, by F. R. Walker Co.; and Construction Accounting and Financial Management, by William Coombs (F. W. Dodge Corp.) A.I.C.P.A. has a very interesting new pamphlet on Contractor's Accounting. The National Association of Accountants has not replied to date.

The only other book of interest I can find is, Construction Cost Control by the American Society of Civil Engineers. I have sent for this book, on approval. Our company's auditors do not handle many contractors, and I'm wondering if it might be to our advantage to retain

Continued on page 140

One of Virginia's busiest highways, but not open to the public—this private haul road safely spans US 301 near Richmond with many hundreds of earthmoving loads per day.

High Speed Haul Road Bridges Busy Arterial

It is often said that earthmoving profits can be made or lost in the haul. This is particularly true when the average haul is long and the potential hauling difficulties aren't properly solved.

An example of excellent hauling management is pictured here. The job takes in a pair of adjoining contracts for grading 3 miles of Interstate 95 immediately north of Richmond, Virginia. The contractors: E. G. Bowles and F. G. Pruitt, Jr., in joint venture, both of Richmond.

This project which extends through gently rolling countryside included 688,000 cu. yd. of roadway excavation and 1,493,000 cu. yd. of borrow. It was principally the latter item that focussed attention on the problem of haul. The borrow yardage was to come from a pair of pit areas located 4,000 ft. or farther offside from the job near the midpoint. The average borrow round-trip was estimated at 2.5 miles.

Besides the unusually long haul for this relatively

Intensive blading, well drained roadbed, good gravel-clay material —this combination is spelling very high hauling efficiency for Bowles-Pruitt.

The construction bridge here will come down after handling 1½ million cubic yards of borrow. Built of salvage I-beams.

short highway segment, there was the problem of getting the borrow material across one of Virginia's busiest arterials, US 301 which parallels the project line. Flagging of vehicles across 301 was considered, but this meant handling 90 to 140 bottom-dump passages per hour going and coming—plus or minus. This highway carries around 7,000 vehicles daily. Flagging at grade was foreseen to be impracticable from either the public's or the contractor's standpoint. The engineers' decision was to approve use of this pit but to require the contractor to bridge US 301 for the hauling.

The upshot was that bidders were advised to include the construction of a hauling bridge in figuring their earthwork bid items. To help minimize these cost items, the Virginia department of highways made salvage H-beams available. From these beams the contractor designed a deck that would "hold up an elephant," in the words of the engineers. The heavy beams spaced 9 in. apart were given welded haunches for greater shear strength at the ends. The beams were covered over with metal floor plates to insure that no dirt filtered down onto the highway below. The deck was earthed over so as to provide a continuous earth haulway that ramped gently over the bridge. The bridge provided a comfortable 26 ft. width between the low side rails, permitting easy, safe passage of bottom-dumps that might meet on the bridge.

The winged abutments each consist of wood piles backed with 4-in. wood cribbing and rolled backfill. The expectation was that the bridge could be taken down at little cost, and the steel beams again salvaged. The wood piling will be removed when the job is done, and the earth ramp will give way to grading and structure work for an interchange in the immediate area.

So much for the bridge. the haul road is fully as newsworthy. This too is a private affair, constructed

over an easement. The flat terrain was built up as a ditched road about 56 ft. wide shoulder-to-shoulder. The roadbed material consisted of sand-clay-gravel out of the borrow pit. This high quality material, plus good drainage, plus compaction under the equipment was expected to give a haul path of low resilience and tractive effort—if properly maintained.

The road has really delivered the goods since hauling began in early summer. It is still doing so, and will be used right up to winter shut down. Maintenance is intensive. Two grader operators and a sprinkler truck spend a good part of each day intensively blading and watering the road across its entire width. The operators make several round trips over the road during each 30-minute noon break, and work singly or in pairs whenever attention is needed, or when the graders can be spared from other work. The aim is to keep a hard-packed surface under the equipment. Tight-blading is often done rather than skimming, such as to elimnate ruts after a rain. The grader operators are skilled men who cooperate to observe safety rules in the midst of the high-speed hauling. With one or two wagons always either just coming near or whizzing past, the gradermen keep well apart from each other during hauling hours. The 56 ft. width permits blading a center strip when necessary while leaving safe passing space on either side for the wagons.

The equipment for the borrw pit operation has consisted initially of eight brand-new Euclid Model 77FDT bottom-dumps with GM Detroit Diesel 6-71 engines; a Euclid Model 9BV loader drawn by Cat D8 and, International TD24 tractor with a Cat D7 pushing; a Cat 14 and a Cat 12 motor grader for haul road maintenance; and a pair of sprinkler trucks. Three more Euclids were added in mid-summer when a second, more distant pit was opened up.

The loader has sent out typically about a load per minute, maintained all-day average. Heaped loads are about 15 cu. yd. loose, or 12 pay yards.A 10-hour day's operation is producing from 6,000 to 8,500 pay yards, depending on the haul. The haulers move in high gear at 32 to 35 mph. The easy acceleration and high maintained speed with little engine laboring give proof that good haul road planning and maintenance have paid off. All Euclids carry Goodrich tires.

Other equipment used in this project for roadway excavation include 2 Cat DW21s, Euclid TS-24 twin engine scraper, C-6 Euclid crawler tractor, 3 D7 or D8 units with Cat 80 or 460 scraper pans, two additional Cat 12s, assorted rollers (one International 660 tractor drawn) and two Michigan and Hough scoops.

The project's systematic equipment refueling and maintenance also have been factors in keeping up top production. The down time for the Euclids on their critical haul job has been "nil," the contractors report. Refueling (Esso) is done to lined-up equipment at the noon break, and also at night. Greasing and PM coverage are done chiefly at night, again with line-up.

Project manager James N. Turner keeps in touch with the firm's Richmond office by radiotelephone. A. P. R. Lovell is resident engineer in charge of the job for the Virginia department of highways. R. R. Dawson is construction assistant resident engineer and K. T. Wingo is chief inspector.

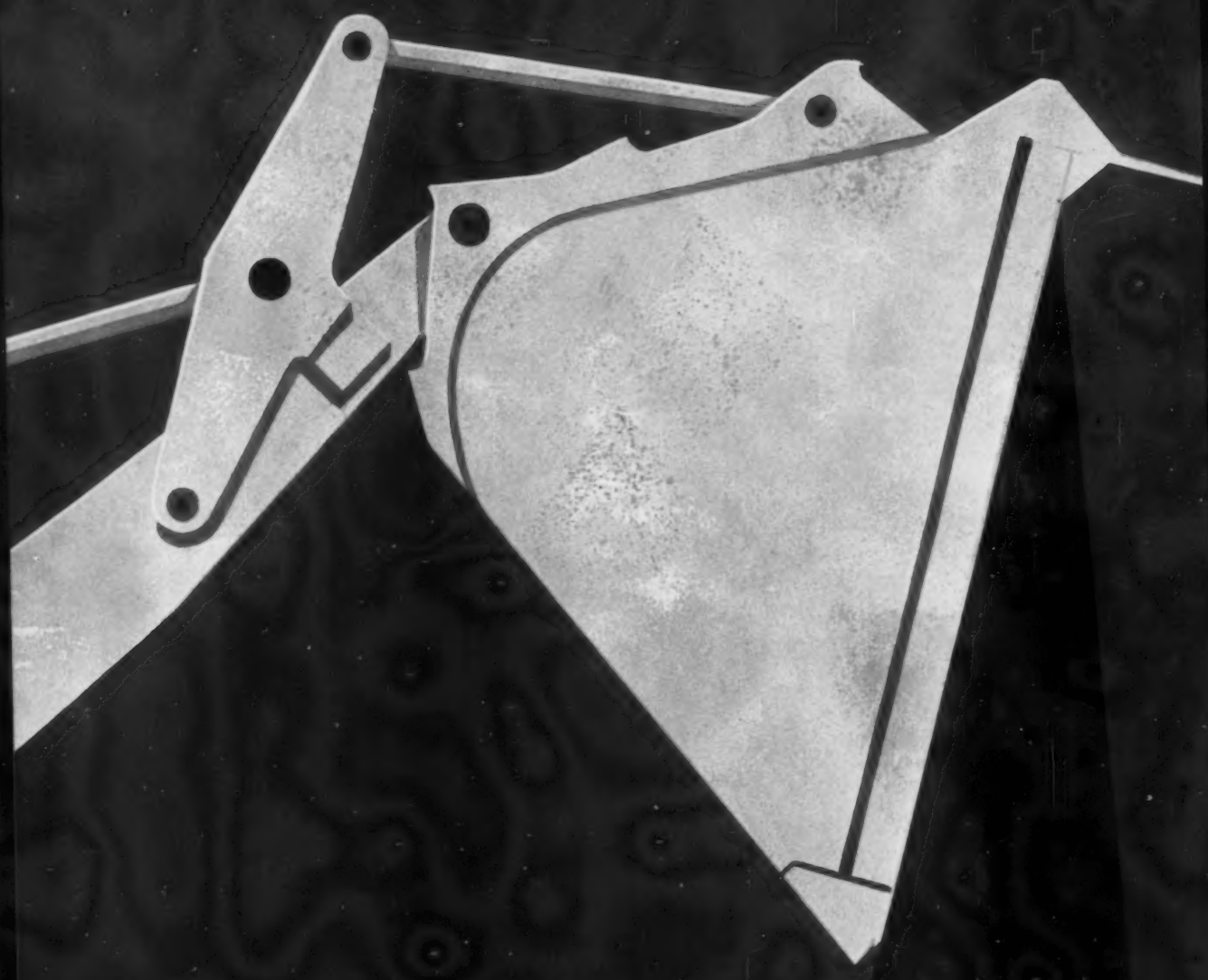
Noontime refueling of Bowles-Pruitt fleet of Euclids. Preventive maintenance and routine lube attention also handled on a line-up when possible.

International 660 diesel wheel tractor handling rolling for an interchange area just over Bowles-Pruitt's construction bridge.

The "yardage generator" seen in the first of the big borrow pits on the project of E.G. Bowles and F.G. Pruitt, Jr.—Euclid 9V loader with pull and push tractors.

BRAND NEW...WITH 7 YEARS' PROOF!

THE GREAT NEW LINE OF CATERPILLAR WHEEL LOADERS



THE NEW 966...2 3/4 YD.,

THE NEW 922...1 1/4 YD.,

Power Shift Transmission. It's Cat-built . . . gives smooth, instant shifting for 1st-2nd speeds . . . forward and reverse. In high-speed travel range, the machine is in 2-wheel drive. A shift to work range puts power to all four wheels for full traction when it is needed.

Operator Safety. Lift arms and cylinders are all forward of the cockpit . . . giving complete freedom of movement. Visibility is excellent at all times. It's easy and safe to get into a Traxcavator from either side . . . up three wide steps. Tires are shielded by fenders.

Operator Convenience. Bucket controls are on the right side, leaving the left hand free for machine operation. The forward-reverse lever is mounted on the steering column for finger-tip shifting without decelerating; 1st and 2nd, high-low range levers placed at left of seat.

Automatic Bucket Positioner. With bucket loaded, lift lever is put in up position. The bucket goes up to dumping height and the control kicks into hold position automatically. While lowering after dumping, a pull on the tilt lever automatically positions bucket for digging.

There's a long history of extensive testing and development behind these new machines. They've been thoroughly proven in a long research program. And you're getting the full benefit of Caterpillar's 23 years of loader leadership . . . 20 years of wheel-tractor building.

All three wheel loaders have been tested, strained, tortured . . . with a field force of Caterpillar engineers watching every move . . . around the clock. After final refinements, these machines went out on customer jobs all over the country. They proved themselves with an unmatched combination of speed, operator safety and convenience, high production and traditional Caterpillar dependability. They're ready now . . . with no compromises.

PROVEN IN 7 YEARS OF TESTS...THE NEW 922 AND 966

THE 922 TRAXCAVATOR—1¼ CU. YD. BUCKET

Proven on the jump-and-run jobs

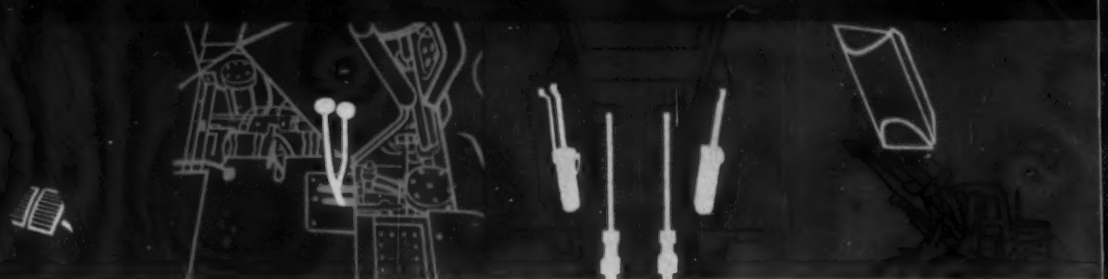
• 80 HP. Choice of compact 4-cylinder Cat turbocharged Diesel Engine (uses low-cost furnace oil) or 6-cylinder gasoline engine with big displacement for long life and sustained power. With either engine you have one source of warranty . . . one source of parts and service . . . your Caterpillar Dealer. • Long 41" reach at 7' dumping height . . . maximum lift of 11' 2".

THE 966 TRAXCAVATOR—2¾ CU. YD. STANDARD BUCKET

Proven on jobs where time is measured in tons of material loaded

• 140 HP from the Caterpillar D333 Diesel Engine, turbocharged for extra efficiency and quick acceleration in machine drive and bucket hydraulics. • 57" reach at 7' dumping height with a maximum lift of 12' 10¼". • LIVE ACTION HYDRAULICS for tough material excavation, fast lift and dump. • DUAL-RATIO STEERING for work and highway travel. Gives operator easy, quick turns for fast maneuvering on work cycles, safe automotive-type steering for high-speed traveling.

BOTH THE 922 AND 966 HAVE ALL THESE PROVEN FEATURES, INTRODUCED BY THE POPULAR 944 TRAXCAVATOR



Dual Brakes. **The left brake neutralizes the transmission as it stops the machine. This transfers extra power to the bucket . . . assuring full loads even in tough material. The right brake stops the machine with the transmission engaged . . . giving full machine control.**

Easy Service Access. **The seat tips forward for easy access to transmission oil filter and control linkage adjustments. Unit construction allows independent removal of engine, transmission, other major components. The dry-type air cleaner can be serviced in about 5 minutes.**

Live Action Hydraulic System. **Plenty of power from the engine is always available to the hydraulic system for fast bucket action. Control valves are enclosed in the steel reservoir for complete protection. The Caterpillar Live Action Hydraulic System is full-flow filtered for trouble-free operation.**

Available with a Complete Line of Attachments. **There are special buckets for light or heavy materials, forks and the exclusive Side Dump Bucket that cuts maneuvering time and space because it dumps to the left as well as forward. A fiber-glass cab is also available.**

- Herff and Fred Harris, owners of the Harris Sand Pit, Von Ormy, Texas, bought a 944 in April and another in June. The first machine was put to work 12 hours a day, 6 days a week. In June its service meter read 740 hours. "We haven't had a minute's down time," said Herff Harris. "This machine's been working! We like everything about it and especially the basic design that gets the lift arms out of the operators' hair. We figure the speed of the machine plus the automatic bucket positioners give us at least 25% more production than other machines of the same size."

REPORTS

FROM THE FIELD:

HERE'S WHY THE 944 HAS GAINED ACCEPTANCE UNMATCHED IN MACHINE HISTORY

- At the Clarksville Stone Co. near Clarksville, Tenn., Charles Day speaks his views of their 944: "I believe this new Traxcavator is the best machine in its class and for several reasons. One is that open, clean deck; our operators are on and off the machine a good deal and on the 944 they can just walk up, sit down and go to work. And I've noticed the stability of the machine is better than the rest; the 944 doesn't tip—it stays on the ground. I've heard our operators talk enthusiastically about the easy controls and especially the automatic bucket positioners. Our best operators are better on the 944."

If there's a 944 operating in your area, chances are you'll get this kind of impressive report from owner and operator. But for the whole story on all 3 wheel loaders, there's only one man to see—YOUR CATERPILLAR DEALER. His staff of materials handling experts and heavy equipment specialists has the full story on the wheel loader line that's brand new with features, but 7 years old with experience. Ask for a demonstration on your job ... see how these wheel Traxcavators make other loaders obsolete.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

ADVANCED AS TOMORROW
CERTAIN AS YESTERDAY

How Many Scrapers Per Push Tractor?

This analysis can ferret out the penny or two of savings that helps low-bidding and makes a profit today.

By R. L. Peurifoy

Construction Consultant, Bryan, Texas

On a construction project idle equipment costs money, produces no income. How much does idle equipment cost you? Consider the largest sizes of pusher tractors, and wheel-type tractor-pulled scrapers having struck capacities of about 20 cu yd. The cost of owning and operating one of these units will run around $15 to $20 per hour, say an average of $18. Under favorable conditions a unit can actually operate about 50 minutes per hour, which means that the cost per operating *minute* will be $18÷50= $0.36.

If, however, a unit actually works only 40 minutes per hour, it will be idle 10 minutes more per hour than is normally expected. The cost of this extra 10 minutes of idleness will be $3.60 per hour for each unit involved. If this cost is multiplied by the number of idle units for the duration of the job, the total cost can be a substantial figure.

While it is unlikely that all idleness can ever be eliminated, good planning and job management can reduce idleness to a minimum. A contractor should know the production potentialities of each major item of equipment. He should know its performance characteristics. And he should know the job conditions on the project where the equipment will be used. With this information a few calculations will enable him to determine how to get production at the lowest possible cost.

The effectiveness of these statements may be illustrated by analyzing the performance of a pusher tractor and tractor-pulled scrapers on a project. For this study consider using either of two sizes of crawler tractors for pushers, and wheel-type scrapers, whose specifications are as follows:

Pusher tractors:
- Type 1—335 hp engine, with power shift
- Type 2—225 hp engine, with power shift

Hauling units:
- Tractor—345 hp engine
- Scraper capacity:
  - Struck—19.5 cu yd
  - Heaped—27 cu yd

Job conditions:
- Earth is sandy clay, weighing 3,000 lb per bank cu yd
- Haul road resistance—120 lb per ton, including rolling resistance and grade resistance for a loaded scraper

Haul distance—varies from 1,000 to 5,000 ft

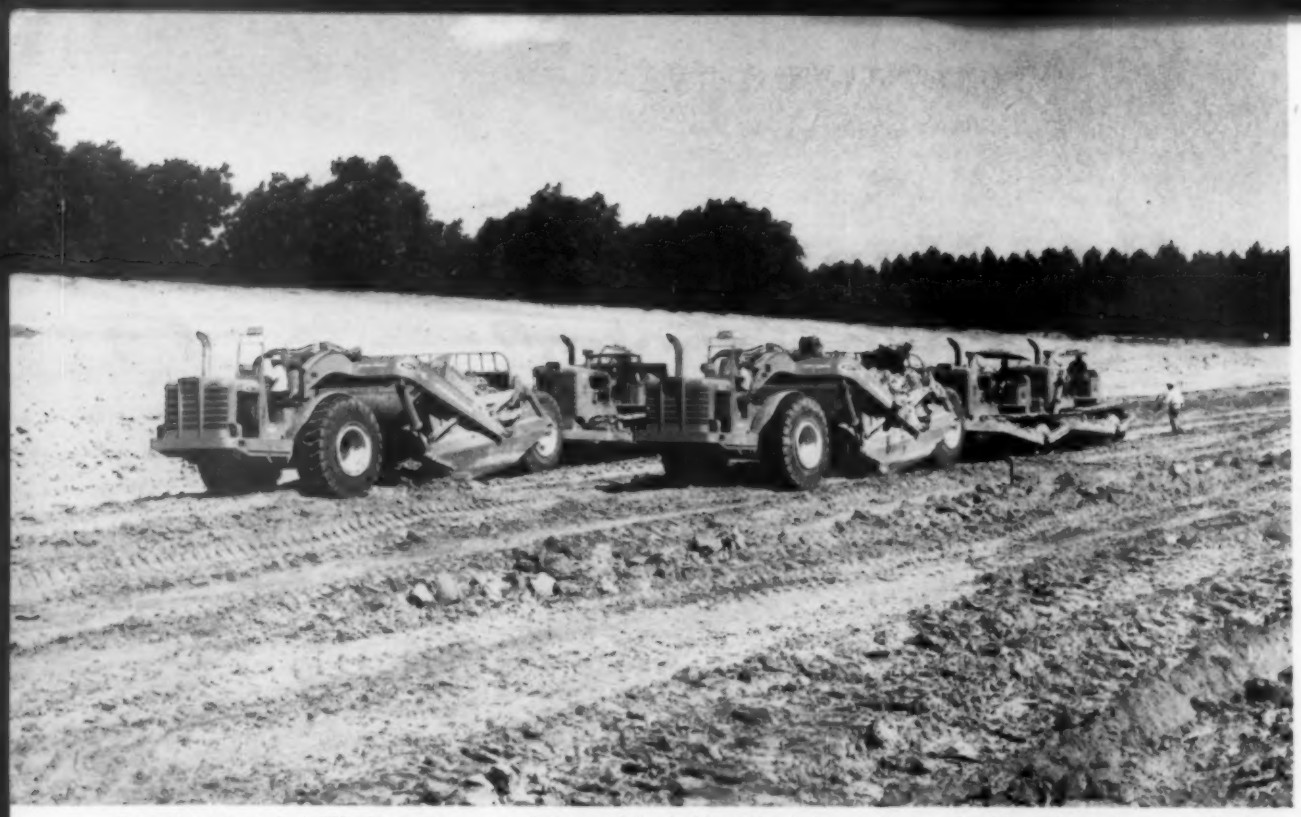
As the haul distance is increased, the cycle time for a scraper will also increase, while the cycle time for a pusher tractor should remain constant. For the stated equipment and job conditions the economical loading time for the 335-hp pusher tractor will be 0.8 minutes, and for the 225-hp pusher tractor it will be 1.0 minute. The corresponding scraper loads will be 19.2 bank cu yd and 18.2 bank cu yd, respectively. The average pusher cycle time will be as shown in Table 1.

The pusher tractors have potential production capacities of 828 and 641 cu yd per hour, depending on which tractor is used. In order to obtain this production it is necessary to use enough scrapers to haul the particular quantity of earth. The number of scrapers required will vary with the scraper cycle time, which will vary with the haul distance.

The calculations for determining the scraper cycle time, production per scraper, and the number of scrapers required are illustrated by considering a 2,000 ft haul distance, for which the results should be about as given in Table 2.

Since it is impossible to provide fractional scrapers, it is necessary to determine whether to use a whole number larger or smaller than the fractional number of units. The decision should be based on the relative cost of loading and hauling earth using each number of scrapers. Table 3 gives the results of the calculations made to determine which number of scrapers is more economical.

Calculations for determining the number of scrapers required for haul distances other than 2,000 ft are



On a Georgia project, TS-360 motor scrapers being push-loaded by HD-21's in a 21-ft. cut. Double pushers, the answer here. Total ratio of pushers to scrapers is an important decision on such projects.

made in a similar manner. Table 3 gives the results of these calculations.

The curves in Figure 1 give the number of scrapers that may be served by each pusher tractor under consideration for haul distances varying from 1,000 to 5,000 ft. Since the curve for the 225-hp tractor is essentially a straight line, and the curve for the 335-hp tractor varies from a straight line only slightly, the curves can be extended to shorter and longer haul distances within reasonable limits without introducing serious errors. The curves in this figure apply for the stated equipment and job conditions. If equipment or job conditions on a project are different from those stated, new curves, which apply to the particular project, should be drawn.

Another method of drawing curves, such as those shown in Figure 1, is to substitute the scraper cycle time for the haul distance. After all, the number of scrapers that can be served by a pusher tractor is a function of the scraper cycle time and the pusher tractor cycle time, or more specifically the number is equal to $\frac{\text{The Scraper Cycle Time}}{\text{The Pusher Cycle Time}}$.

While the scraper cycle time is related to the haul distance, it is also related to the condition and grade of the haul road, as well as to the condition of the dumping site. If a set of curves is prepared using scraper cycle time instead of haul distance, the curves may be used without modification for any job conditions for which the scraper cycle time can be determined. Figure 2 illustrates the curves for the same

Table 1–Average Pusher Cycle Time

Operation	Time in minutes 335 hp tractor	225 hp tractor
Loading	0.80	1.00
Boosting scraper	0.05	0.06
Returning	0.15	0.20
Approaching scraper	0.16	0.16
Total time	1.16	1.42
Scrapers loaded per hour	43.1	35.2
Scraper payload, bank cu. yd.	19.2	18.2
Potential pusher production, cu. yd. per hour	828	641

Table 2–Number of Scrapers Per Pusher

Operation	Time in minutes for Pusher tractor used 335 hp	225 hp
Loading	0.80	1.00
Hauling, $\frac{2{,}000}{12.4 \times 88}$	1.84	1.84
Returning, $\frac{2{,}000}{22.6 \times 88}$	1.01	1.01
Accelerating and decelerating	1.00	1.00
Turning, dumping, and boosting	1.30	1.31
Cycle time	5.95	6.16
Trips per 50-min hour	8.41	8.13
Payload, cu yd	19.2	18.2
Scraper production, cu yd per hour	161	148
Pusher production capacity, cu yd per hour	828	641
Number of scrapers required	5.13	4.33

Table 3. Number of Scrapers Served by a Pusher Tractor and the Cost of Handling Earth

For 335-hp pusher tractor. Scraper payload, 19.2 cu yd. Pusher production, 828 cu yd per hr

Haul distance, ft	Cycle time, min	Trips per hr	Production per unit, C.Y. per hr	No. of scrapers required	No. of scrapers used	Total production, C.Y. per hr	Equipment cost per hr	Cost per cu yd
1,000	4.53	11.04	212	3.91	3	636	$ 69.00	$0.108
					4	828	86.00	0.104
1,500	5.24	9.56	183	4.52	4	732	86.00	0.117
					5	828	103.00	0.125
2,000	5.95	8.40	161	5.13	5	805	103.00	0.128
2,500	6.66	7.52	144	5.75	5	720	103.00	0.143
					6	828	120.00	0.145
3,000	7.38	6.78	130	6.37	6	780	120.00	0.154
					7	828	137.00	0.166
4,000	8.80	5.70	109	7.60	7	749	137.00	0.183
					8	828	154.00	0.186
5,000	10.22	4.88	94	8.82	8	752	154.00	0.205
					9	828	171.00	0.207

For 225-hp tractor. Scraper payload, 18.2 cu yd. Pusher production, 641 cu yd per hr.

1,000	4.74	10.55	192	3.34	3	576	$ 64.80	$0.113
					4	641	81.80	0.128
1,500	5.45	9.18	167	3.84	3	501	64.80	0.129
					4	641	81.80	0.128
2,000	6.16	8.12	148	4.33	4	592	81.80	0.138
					5	641	98.80	0.154
2,500	6.87	7.28	132	4.85	4	528	81.80	0.155
					5	641	98.80	0.154
3,000	7.59	6.60	120	5.34	5	600	98.80	0.164
					6	641	115.80	0.181
4,000	9.01	5.55	101	6.35	6	606	115.80	0.191
					7	641	132.80	0.207
5,000	10.43	4.78	87	7.37	7	609	132.80	0.218
					8	641	149.80	0.234

Note: The equipment cost is based on the following prices:
335-hp pusher tractor, $18.00 per hr
225-hp pusher tractor, $13.80 per hr
Scraper, $17.00 per hr

two tractors and the scrapers, using cycle time. The curves are straight lines, as an analysis of the calculations will indicate they should be.

It is interesting and enlightening to examine the information which appears in Table 3. For each stated haul distance the number of scrapers required involves a fractional unit. Since it is impossible to determine whether to use the smaller or larger whole number of units. The decision should be based on which selection will give the lower cost of handling earth. For example, for the 335-hp tractor and a haul distance of 2,500 ft, 5.75 scrapers are required for a perfect balance between the pusher and the scrapers.

Since this number is much closer to 6 than to 5, a quick decision, without a cost analysis, would indicate the use of 6 units. However, an examination of the cost per cubic yard resulting from the use of each number of units reveals that the use of 5 units will give a slightly lower cost, and with a smaller investment in construction equipment.

Thus, unless the higher production obtainable with 6 scrapers is essential or desirable, 5 scrapers should be used.

Why should the use of 6 scrapers instead of 5 result in a slight increase in the cost per cubic yard? The cost of the 6th scraper is $17.00 per hour. The additional production gained by using 6 scrapers is 108 cu yd per hour, owing to the potential production capacity of the pusher tractor. For this additional

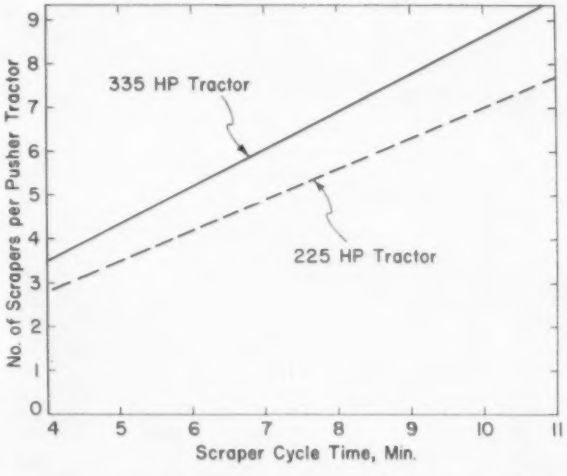


Figure 1. Number of scrapers that can be served by a push tractor.

Continued on page 119

Tires on this Ohio freeway job represented a major capital investment and hourly cost item, but also a key to maximum profits.

Earthmoving Tire Tips

By Walter J. Lee
Director of Engineering Tire Development
The Goodyear Tire & Rubber Company

The typical earthmoving contractor realizes the importance of tires. Selection of the proper tire for earthmoving equipment can mean the difference between profit and loss in a construction job. The contractor has reason therefore to choose his tires as carefully as his men and machinery.

And he has good reason to see that his organization reviews tire fundamentals periodically. The following summary should help check organization practices where necessary.

In the operation of large earthmoving vehicles having tires 16.00 or larger, the tire cost is second only to that of fuel and oil. Thus, it is important that the contractor spend his tire dollar for types that give him the most mileage and production in return.

There is no simple yardstick by which a contractor can measure his vehicle and read off the proper specifications for the carcass construction, tread design and ply rating he will need.

His choice should depend on the vehicle, to be sure. But beyond that it should include an analysis of the job operating conditions.

This analysis considers such factors as the weight of the loads the vehicle will carry, speeds, conditions of the surface on which the vehicle will operate, and maintenance methods. All of these and other conditions have a bearing on the life and performance of the tire.

If the hauling conditions are to be particularly adverse, the vehicle to be overloaded, hauls to be unusually long, or speeds to be higher than normal—then the contractor would do well to get help from a tire company expert.

Before going further, let's look at some of the problems facing the engineers who design the tires.

Because of the very nature of its task—moving heavy loads over bruising, cutting terrain—the tire must have strong muscles of rubber and fabric. Providing these muscles means weight and thickness, and these factors add to the tire's tendency to generate internal heat—one of its greatest enemies.

Excessive heat affects the strength properties of the materials in the tire and the adhesion between the various tire components.

There are two main things which can cause excessive heat buildup in an off-the-road tire. One is speed. As

Editor's Note: Tires are one of the most important tools of the construction project. They can be costly tools if they don't fit the needs and conditions of the job or if they are improperly maintained.

For guidance in proper selection and maintenance of off-the-road, earthmover tires, Roads and Streets takes this opportunity to pass along the thinking of a Goodyear expert who, since 1922 has contributed in all phases of tire engineering, design and compounding.

Keeping tires properly inflated is a maintenance routine that can add many miles to their life. Pressure checks require positive management control.

The right handling equipment saves delays in changing big tires. (Note support rod under truck frame, aid in maintaining stability.)

Prying out a stone which became lodged next to a rim on an earthmoving vehicle. Such maintenance procedures can cut down time and tire repair costs.

Another tire saving operation: Goodyear service representative uses screwdriver to dig out a stone imbedded in the tread.

speed rises, the rate of tire flexing rises, with heat going up in proportion. (See chart.)

The other is overload. An increased load also increases flexing, which develops heat. (Again, see chart.) And, the longer the haul, the greater the heat build-up.

Speed, in addition to its part in heat build-up, has another major effect on the tire. The degree of shock when the tire hits a rock or other obstacle is increased by the "square" of the speed rather than in direct proportion. In other words, blows hitting a tire at 30 mph are *nine times* as severe as at 10 mph, other factors being equal.

It would be convenient for both the tire manufacturer and the consumer if one tire model could be made to meet all conditions. This is impossible. What has been done, however, is to design several lines, each particularly fitted for one type of operation and set of conditions.

To permit earth moving vehicles to operate efficiently in varying types of service, it is necessary to have optional tire equipment which provides varying degrees of flotation, traction and resistance to both cutting and treadwear.

Accordingly, vehicle manufacturers generally permit specification of different tires for each model of equipment.

Tire manuals and data books provide guides to selection of the "right" tires for vehicle and service conditions.

Following are some general examples of tire selection:

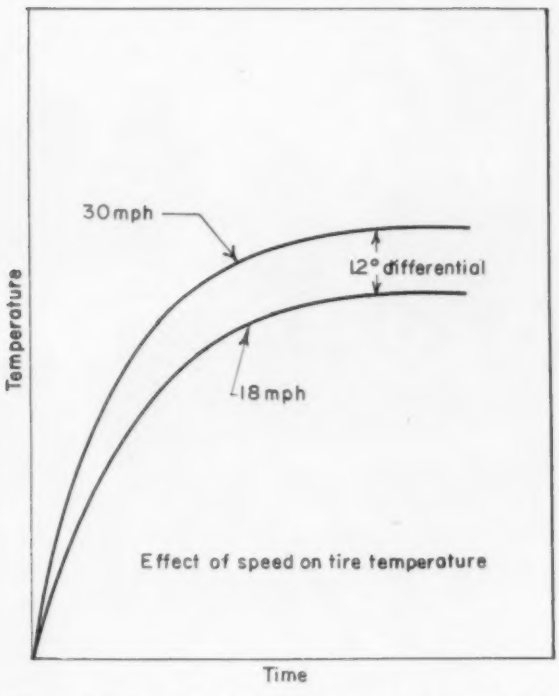
1. Rock type tires in regular and extra tread designs are suitable for use on rear-dump and bottom-dump trucks, scrapers and bulldozers in mining, rock excavation and road construction work. These tires have strong carcass construction, thick, heavy lugs and tough tread compounds for maximum resistance to cutting and chipping. For front wheels in the same type of operation, use rib type, rock design tires. These have the same basic features as the other rock type tires, and provide steering and lateral traction.

2. For work in soft, muddy and slippery terrain, directional traction-type tires are available. These tires generally are constructed with a full non-skid tread design which tapers out and has open center bars to permit them to dig in deep for strong pulls in soft surfaces. The tread pattern also has self-cleaning properties when operating in mud. Like the rock type, these tires have strong carcasses and tough tread compounds for chipping and cutting resistance.

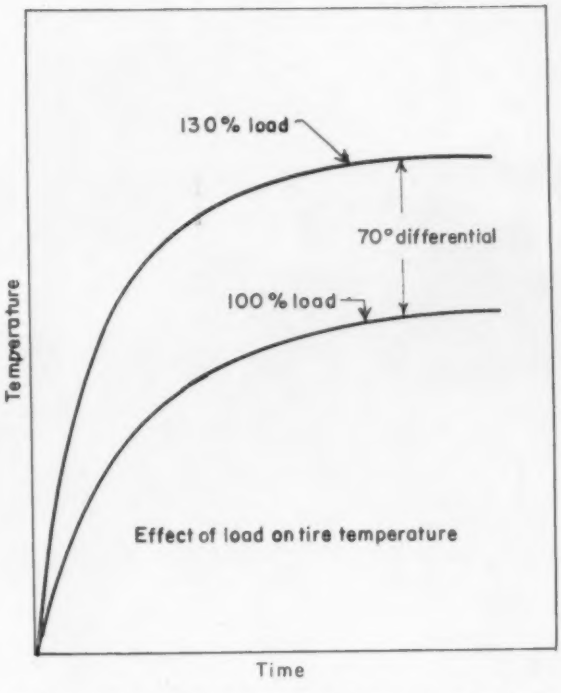
3. For free-rolling wheels and sometimes on drive wheels for flotation on sandy and marshy terrain, a button or diamond type, all-purpose tire is recommended. The tread design elements are engineered to give a compromise forward and lateral traction, flotation characteristics and self-cleaning ability. A strong carcass construction is essential in this type of tire, too.

To gain an idea of the importance of proper tire selection, consider the results of a 9-month study made recently of tire performance in a coal strip mining operation.

Similar vehicles, performing an identical type of service in the operation, were equipped with two different tire constructions.



How reduced speed of hauling cut tire temperature and hence is a factor in cost consideration.



Load too is a factor in tire temperature. Heavier loads mean hotter tires, other factors being equal.

Tires of one type, better fitted for the service conditions, delivered an average of 10,000 more miles than those of the other type.

Look to your Maintenance. Once a contractor has made the proper tire selection, he should take a second step—maintenance—to ensure maximum, trouble-free mileage.

In most construction jobs, a regular schedule is followed for servicing vehicles and machinery. This service should include a daily, routine inspection of tires.

Each morning, or at other times when the tires are cool, the inflation should be checked and adjusted to prevent excessive flexing and sidewall breakdown. If it is necessary to check on the job during refueling or lubricating, allow for pressure build-up from generated heat. If the tire is considerably underinflated, the vehicle should not operate until the cause of the leak is determined and repairs are made.

Tires also should be inspected for cuts which penetrate into the cord body. These should be repaired, or further deterioration of the cord will follow. Shallow cuts should be skived out with a knife or bull nosed rasp so that small stones will not become imbedded and gradually work through the carcass.

Rims and rim flanges should be examined for damage. If tires are dismounted for repair, the rims should be cleaned and painted to facilitate mounting and prevent rust accumulation. Oil or grease on the rim assemblies or tires should be removed, as this will cause deterioration of the rubber and lead to premature tire failure.

Careful checks should be made for tire damage due

Continued on page 136

Talking over speeds, haul distances and surface conditions on a road job near Painesville, Ohio: John Simonetti, project engineer for the Great Lakes Construction Co.; O. G. Sherrick, Jr., contractors' service representative fo Goodyear; P. W. Gharky, master mechanic for Great Lakes; and H. G. Constantine, Goodyear sales representative.

The season's

Geo. M. Brewster & Son, Inc solution includes use of one dozer, this big 375 hp Michigan, to spread 25,000 yds daily on 3 fills

How would you handle a job where the state-specified borrow pit was on an island and the main fill was across 400 ft of river water . . . and where there were no bridges in between?

This was the puzzling problem faced by bidders on a 1,400,000 yd, 4 mile section of Route 129 Freeway near Trenton, New Jersey.

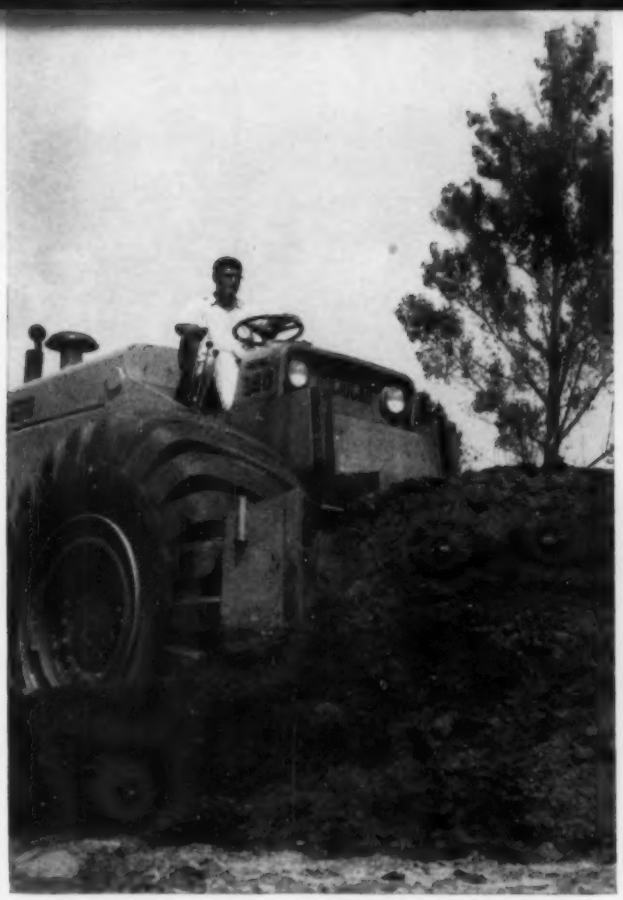
Think about it. What *would* be *your* method of bidding?

Would it be dredging? Some firms figured that way. Or building high trestles above the river to serve as haul roads? Or using barges to ferry fill across the water? Or what?

Flood danger makes speed essential

The successful bidder in this case had a different solution —one as novel as the problem. Geo. M. Brewster & Son, Inc, well-known Bogota, N. J. contractor, placed their bid, roughly $4,500,000, on a gamble. They would dam the inside channel of the river on its upstream side, let the water drain, then build several inexpensive earth causeways to the mainland fill area. The question was, "Could they move the necessary dirt quickly enough to avoid high water, yet economically enough to do the job at a profit?" For this river, the Delaware, has been known to rise at least 15 ft above its present normal stage. The bid was low . . . the job won . . . but speed became absolutely vital.

Fast mobile equipment and two 10-hour shifts per day were the basic choice. Yet for economy reasons a relatively small fleet did all work. A tractor-pulled and pushed belt-loader did the loading. Ten 16-yd bottom-dumps moved the fill. One machine—a high-speed 375 hp Michigan



most unusual job

Model 380 Tractor Dozer—handled *all* spreading.

Michigan replaces 2 or 3 crawlers

Brewster figures that because of its 25 mph speed and its power, the big Michigan replaced two or three large crawler dozers. *Working alone, it easily handled three separate dumping areas.* One pass forward leveled each long line of dumps . . . one in reverse back-bladed . . . then the Michigan would drive to another fill area where the operation would be repeated.

Tires help compaction

In this way, the one 375 hp unit took care of all 10 haulers and all fills. It regularly spread 25,000 yds of soft silty sand every 20-hour day. Despite high production demands, it even had time to clean up and make extra compaction passes. In fact, Brewster figures the large low-pressure tires on his 75,000 lb Michigan did the bulk of the compacting—even though the New Jersey Highway Department required final use of vibrating rollers.

. . . for more details circle 292 on enclosed return postal card

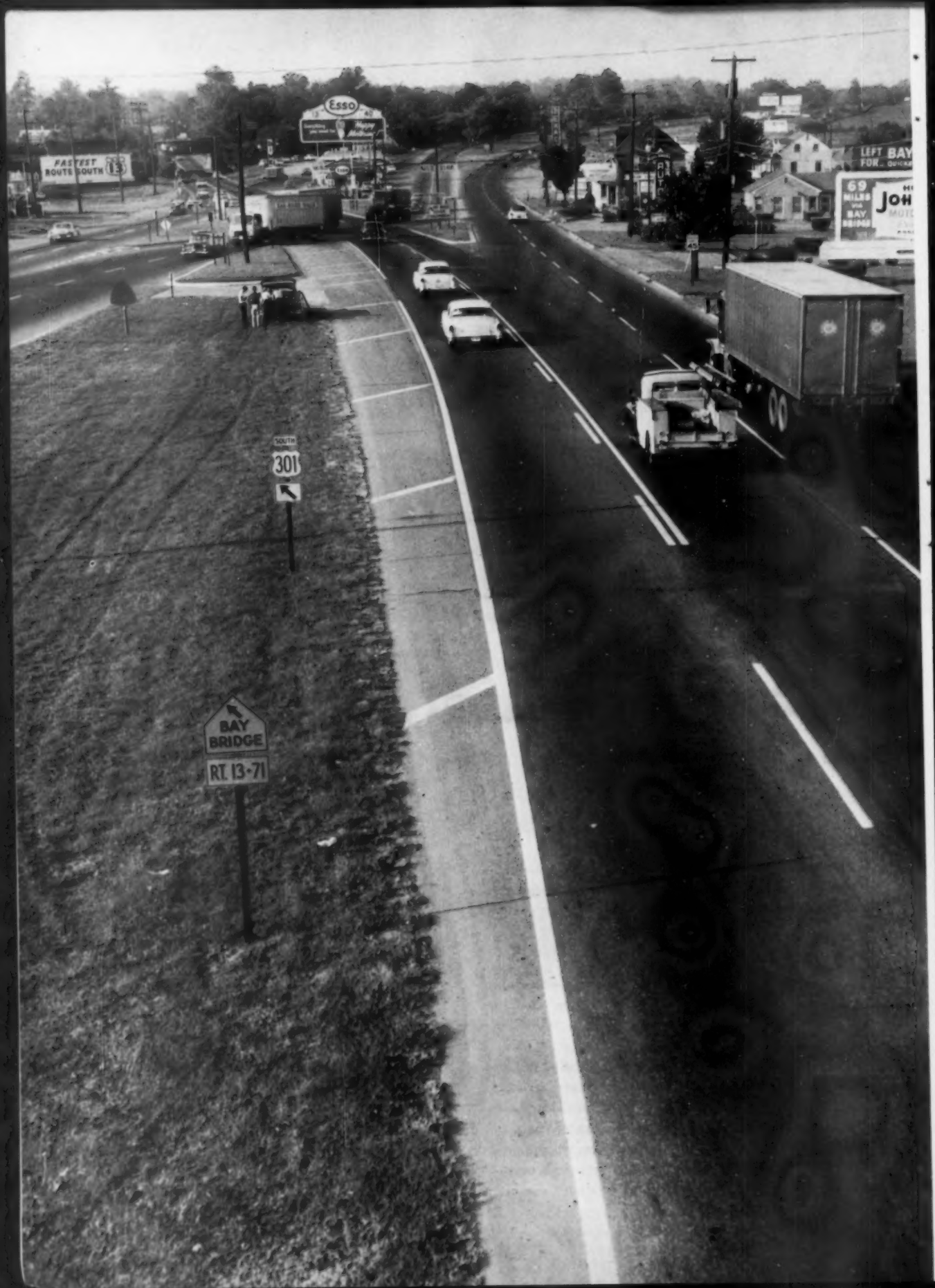
Unit also reduces maintenance

In the final analysis, dirtmoving completed long before flood season, use of the big Michigan had cut costs in some extremely important ways. One, it alone did the work of several of the biggest crawler-dozers. Two, it completely eliminated track maintenance and repairs, which in sand like this, could total $10 per hour, or more! Three, it proved versatile enough to spread gravel sub-base as well as sand fill, handle emergency truck towing, and do much of the compaction on all 3 fills.

Michigan job-proved Tractor Dozers could do the same for you! Pick the size to fit *your job*—162, 262, 375 or *600 hp*—then call your Michigan Distributor for a demonstration. You name the time and place.

CLARK EQUIPMENT

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2479 Pipestone Road, Benton Harbor 16, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario


Esso
FASTEST ROUTE SOUTH
13
LEFT BAY
FOR
69 MILES via BAY BRIDGE
SOUTH
301
BAY BRIDGE
RT. 13-71

Two-Tone Channelizing Solution

By William R. Carrow
Traffic Engineer
Delaware State Highway Department

Paint was the principal ingredient in a channelization scheme devised for a troublesome Delaware arterial junction. The location is the intersection of US 13 and US 40 and the beginning point of US 301 just south of Wilmington.

Referring to the layout, this intersection handled traffic tolerably well in a southbound direction (US 13-US 301). However, during periods of heavy traffic, two lanes of waiting vehicles backed up from the southbound signal. With the two lanes on the right side of the 40-ft. pavement, the rear end of the third waiting vehicle in the right-hand lane would foul the left-hand lane of the two US Route 40 lanes.

When more vehicles would have to wait in that lane, it would leave but one lane for US Route 40 through traffic.

Also, should an undecided driver make the wrong turn, the island held him on the wrong road, and he properly had to go to the cross-over, approximately 250 ft. south, in order to get back on US 40. At times he would turn right against US Route 40 northbound traffic and bull his way back to the southbound roadway.

Under the new scheme, US Route 13 traffic southbound is kept against the left curb as far as the intersection. This increases the storage area to six vehicles. It also provides a 150-ft. decision area in front of the island. Flex-o-Guides, vertical rubber tubes with reflective bands on them, will be used sparingly to discourage the use of this area.

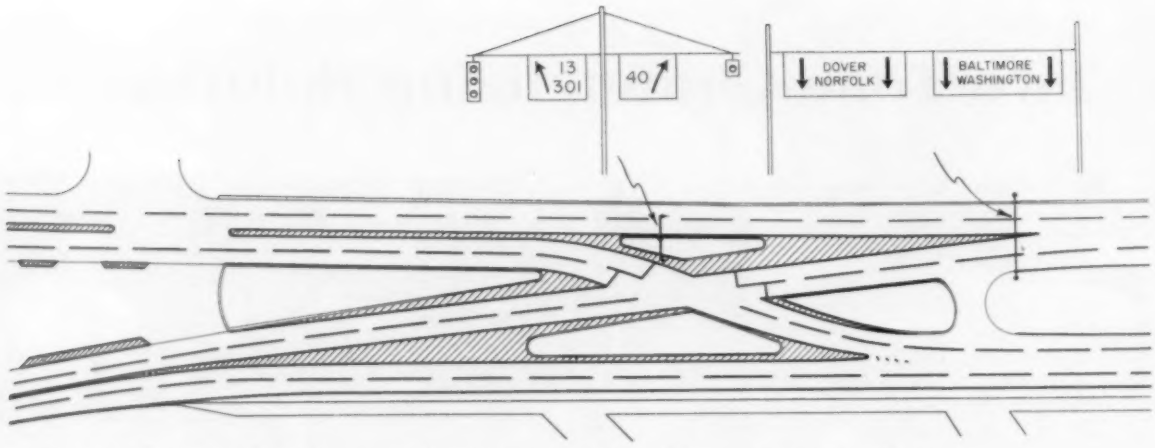
The pavement area *not* to be driven on is lined in white and filled with green reflective traffic

Highway department personnel begin work removing the old lane marker lines prior to the lane shifting operation.

Workmen putting down the green channelization paint and distributing the reflecting beads on the paint.

The complete channelization. Note the increased traffic storage space and the separation of the stopping lines where traffic from Route 40 crosses Route 13.

← Intersection of US Routes 13 and 40, which carries an average of approximately 60,000 vehicles each 24 hours, as it appeared before the paint channelization. Note the severely limited traffic storage space on the left.



Showing the geometrics and solution details for improvement of the Delaware intersection—US 13 and 40 with US 301.

paint. (The green color is to simulate grass islands). The purpose is two fold: (1) to discourage drivers from traveling on that portion of the highway; and (2) to give the roadway a more finished appearance without the hazard of a true island.

In making the changeover, the following steps were taken:

1. Old paint stripes were removed from the formerly unsused portion of the road.

2. New lane and edge lines were painted on that portion of the road.

3. Traffic was shifted onto the left lane of the new system.

4. Paint removal and new lane painting was then accomplished in the protected area.

5. As soon as the island area was outlined, a painter sprayed the area with green paint, which another follows immediately behind scattering beads by hand. The beading process was replaced by a hand sphere gun for beads.

6. The last step was the edge lining of the approach roads to the intersection, and painting of the channelizing between the two roads.

7. Flex-o-Guides were placed in the appropriate locations.

Much of the remaining indecision of drivers at this intersection is removed by new overhead signs subsequently installed at the gore.

After nearly a year this channelization system is working well, with noticeably less confusion on the driver's part and less concern on the part of the Department. This scheme of channelization is being extended throughout the state to locations where it will serve a good purpose.

COURT DECISIONS

Connecting State Highway

Application made by a contractor engaged in the construction of a state road connecting a Montana highway with U.S. Highway No. 83, against the violence of a local union was denied. Appeal from that determination was before the Supreme Court of that state for decision on July 8th.

In sustaining the lower court and holding this dispute not within the jurisdiction of the state courts but governed by the National Labor Relations Act the court said, "The purpose of establishing and building highways is to facilitate the movement of traffic carrying both persons and goods on the highway. Although this is a state highway it is connected with highways in other states and some of the material used thereon would be shipped from other states.

"This contractor, being engaged in other projects involving interstate commerce, it appears that it is proper to hold that the N.L.R.B. has jurisdiction and that the project and the contractor are subject to the Labor Relations Act."

Lindsay v. Teamsters Local 74, (C.C.H.) 37 Lab. Cas. 67,368, July 8, 1959

Work in Excess of Contract

In the case of Bedrock Foundations, Inc., v. Geo. H. Brewster & Son, Inc., November 9, 1959, the New Jersey Supreme Court held that New Jersey highway department officials were not liable to the contractor for compensation due the subcontractor for work performed in excess of the contract, even when such work is done at the direction of the department's engineer.

The contractor contended that the engineer, in requiring the extra work he believed necessary to the safety of the bridge, was liable for the extra compensation due the subcontractor who performed the work. The Court held otherwise. It pointed out "the common law soundly recognized an immunity in favor of public officials from civil liability in connection with the performance of their public duties." Since there was no fraud or malice involved, the rule applied in this case.

The Court indicated the contention of the contractor would have been in "better light" if he had sought to place the responsibility for the work on the highway department.

Soil-cement was used to stabilize shoulders on a 14.3-mile section of U.S. 49 north of Jackson, Miss. The 10-ft. shoulders on each side of the 24-ft. concrete pavement were treated to a depth of 6" with 4.5 per cent cement by volume.

On U.S. 49, Jackson, Mississippi...

shoulders are built for safety and savings

...soil-cement grows stronger year by year!

Soil-cement outlasts any other shoulder material . . . is the strongest pavement short of concrete!

Every stop is a safe stop on sturdy soil-cement shoulders.

This material *stays* strong and solid . . . whatever the weather. Won't wash out. No potholes . . . no soft spots or raveled edges.

Such safety isn't expensive, either. Old, worn-out gravel shoulders, or soil right at the site, can be the main ingredient . . . so *75% of the materials are usually free!*

And because construction is so easy, soil-cement is the fastest-laid pavement there is. Just mix the soil with portland cement and water. Roll it, let it harden, then top with a thin bituminous covering. That's it.

Today, soil-cement is the fastest-growing, low-cost pavement for roads, streets, shoulders, subbases, airports and parking lots. Free booklet on request, *"Soil-Cement Shoulders for Modern Highways."* (U.S. and Canada only.)

PORTLAND CEMENT ASSOCIATION

Dept. 9-28, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete

25 YEARS SOIL-CEMENT 1935-1960

NO SEASONAL LAYOFFS ALL SEASON PAYOFFS!

180° SPEED SWING

ALL-PURPOSE MATERIAL HANDLER

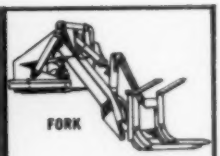
YOU PROFIT with a Pettibone Speed Swing because you never have to lay it off due to seasonal changes or job operation difficulties.

Its amazing *versatility* and *all-around applicability* puts it *on call 365 days a year!* It's always ready and able to handle every call covering a host of different kinds of jobs. In fact, the necessary downtime of a Speed Swing is held to an absolute minimum . . . just long enough for you to make a fast switch to any one of the 10 *quickly-interchangeable* attachments. Then it's off to tackle the next job on your schedule. And this goes on the year around!

With the *exclusive* Pettibone 180° swinging boom, it handles a score of different materials *faster* and safer because it *swings the load* instead of *the loader.* There's no gee-hawing, no costly, time-consuming maneuvering all over the lot! The Speed Swing works up close to the job with maximum safety, right alongside or in back of trucks . . . out of the way of moving traffic, out of the way of other equipment, out of the way of other workmen—OUT-PERFORMING other material-handling equipment day-in, day-out . . . on job sites of every description!

And, when winter comes, the Speed Swing will remove snow in record time without obstructing traffic. Or load out sand, cinders, or salt products for ice control. The above are just a *few* of the many reasons why the owner of a Speed Swing has *no seasonal layoffs* . . . just ALL-SEASON PAYOFFS!

Learn *all* the reasons why the Pettibone 180° Speed Swing is the *most versatile, most productive* all-purpose material handler for you. Write today!


FORK

BUCKET

CRANE HOOK

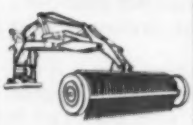
18' BOOM EXTENSION

WIRE & PIPE HOOK

BACKHOE

CLAMSHELL

BACKFILLER BLADE

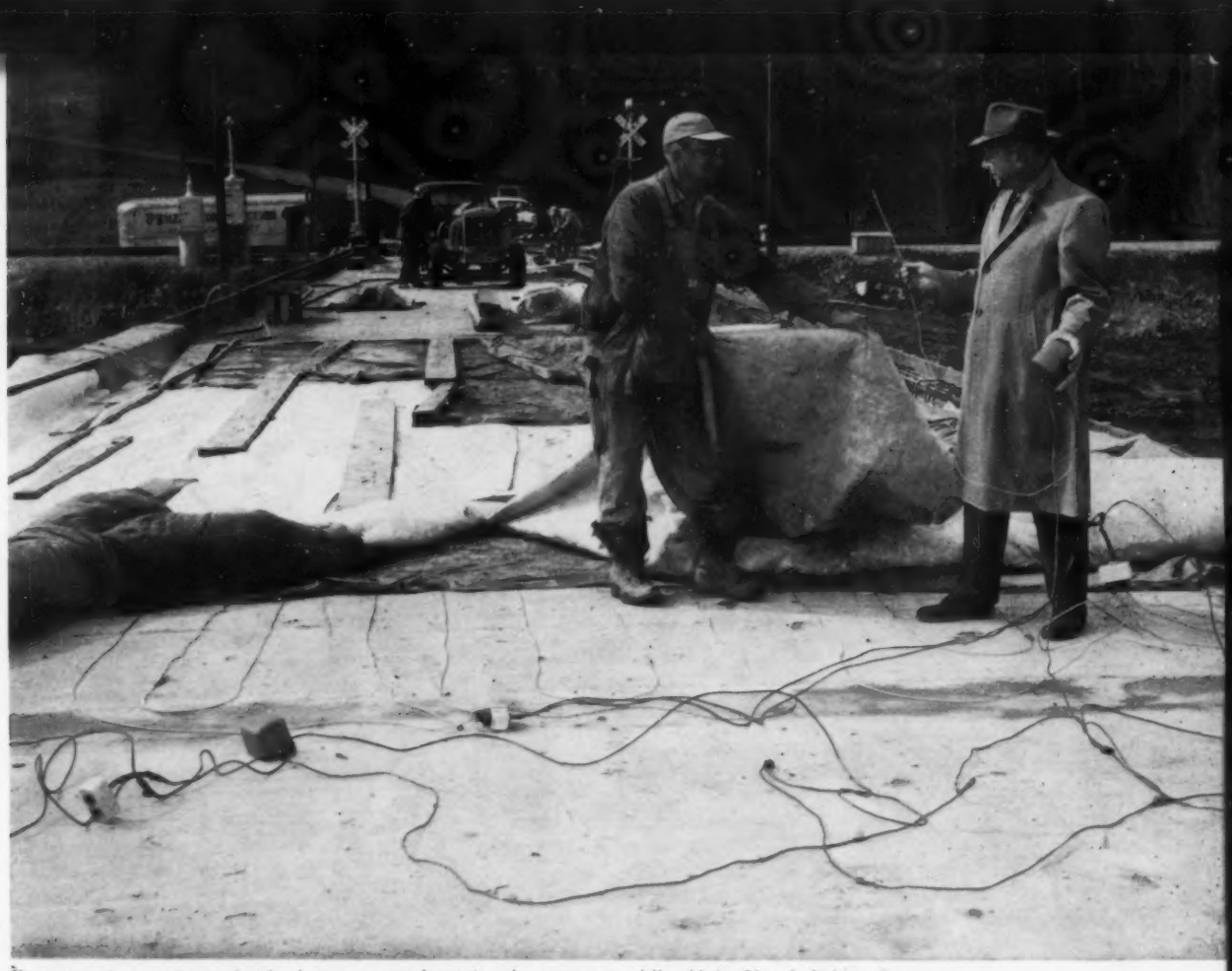

BEACH RAKE

4 CU. YD. SNOW BUCKET

PETTIBONE MULLIKEN CORPORATION

4700 WEST DIVISION STREET • CHICAGO 51, ILLINOIS

. . . for more details circle 337 on enclosed return postal card



Carl Penzel, contractor, holds thermostat and sensing instruments while Alvin Nagel, bridge foreman, holds a 2-in. thick fiber glass banket covered with polyethylene plastic film. Mr. Penzel reported a savings in cost and worry.

Winter Deck Job Cured With Resistance Wires

AN effective means of curing a concrete bridge deck in winter weather was used by Penzel Construction Company, Jackson, Missouri. The company employed electrical resistance heating for the superstructure of a bridge on Missouri Route E in Perry County.

Before describing this method, it might be interesting to review various methods used in the past to cure concrete on highway jobs in Southeast Missouri. As discussed by Carl Penzel of AGC of Missouri in the Association's magazine, Construction Advisor, Mr. Penzel remembers his father, Linus Penzel, using kerosene lanterns to heat concrete culverts during the '20's. Later, kerosene bathroom heaters with circular wicks were employed — often with sooty results.

During the 1930's, heating was paid for as a contract item on some projects. Steam boilers were used with much shoveling of coal and tinkering with injectors. Sometimes cold water was splashed on a hot injector in a big hurry to beat a steadily lowering water level in the gauge class. Leaking steam pipes and the rolling of boiler tubes between curing periods added to contractor woes.

Coke burning salamanders were sometimes used with the accompanying fumes, danger and dry spots on the concrete. During the 1940's and after World War II, oil burning salamanders came into use. These were fairly satisfactory when there was enough room to use them and enough air for proper combustion; but they still required watch-

Closer view showing insulated wires layed at intervals on the new concrete.

ing and refueling. In the early 1950's, liquefied petroleum salamanders were introduced, with better results. Still looking for improvements, the Missouri contractors got better temperature control by electric thermostat in 1954.

A natural gas conversion burner, the kind used to convert a coal or oil burning furnace to natural gas fuel was then purchased by Penzel. The system worked much like that of the heating system in a building, but with the thermostat placed near the concrete being cured. Still, winter winds blew the tarpaulins loose; heating the top side of a slab under an enclosure was difficult because the convected heat just naturally went upward.

With the availability of polyethylene covered quilts of fiber glass, a system of electrical resistance heating was designed in the fall of 1958. What are commonly called "greenhouse" electric heating cable were purchased. These are resistance wires enclosed in several layers of insulation, metal braid and a nylon outer cover, designed to be buried in the earth in greenhouse planting flats. The heating cables used were 100 ft. long and designed for 110 volt operation. Each cable used 500 watts of electric current and produced 17 Btu's per lin. ft. A thermostat was designed for use with the heating cable, with a 60-in. capillary tube connecting to the tubular temperature sensing element.

The operation was as follows: as soon as the concrete finishers were through with the bridge floor, the resistance heating cables were placed 12 in. apart on the surface. Each cable used 4.11 amperes at 110 volts, permitting six cables per 25-ampere thermostat. A sensing element was placed midpoint between cable lines.

After the cable was laid, the bridge surface was covered with the Missouri highway department specified burlap quilt, saturated with water. This was done for two reasons: (1) the Missouri specifications required the wet quilt for proper curing, and (2) the water was needed to help disperse the heat produced by the cable and thereby help prevent hot spots.

The wet burlap quilt was covered with the 2-in. thick polyethylene protected fiber glass blanket. Care was taken to see that the insulation covered every portion of the concrete, extending over the sides and down about 3 ft. As a protection against foot traffic, burlap, tarpaulins or other suitable cover, was placed over the insulation. Boards were placed on top to tie down the cover during winds.

The thermostats were set at 80 deg. and the heat turned on. Tarpaulins were hung from the sides of the bridge floor to the ground, or from side to side of the bridge on the underside where it was high.

A thermostatically controlled liquefied petroleum gas furnace, as mentioned earlier, was placed under the bridge floor with a suitable metal baffle above to prevent hot spots. The thermostat from the furnace was placed several feet from the end of the newly poured slab, against the forms on the underside and set at 65 deg.

The heating cable produced 17 Btu's of heat per sq. ft. when spaced on 12-in. centers. The insulation as used gave a calculated U factor of .12, which is very good.

On each of the four pours a beam break of over 600 psi was obtained at 5 days. During one curing period the outside air temperature reached near zero with a 20 mph wind. When the insulation was pulled back at the end of the curing period, water could be pressed easily from the burlap quilt.

Cost of the electric current was estimated at about two-thirds of the cost of liquefied petroleum gas.

Glen Surface was superintendent of the project for the contractor and D. C. McGuire resident engineer for the Missouri state highway department.

ONLY ALLIS-CHALMERS MOTOR SCRAPERS

give you

FULL POWER

...in every phase of the cycle

FULL POWER TRACTION
FULL POWER PENETRATION
FULL POWER EJECTION
FULL POWER STEERING

Steady production...even in mud

Fast, controlled loading

Quick, controlled loading

Safe, positive turning

FULL POWER STEERING

Only Allis-Chalmers gives you this exclusive combination . . . a separate hydraulic system just for steering, exclusive multiplier links, and double-acting steering jacks.

These are the big reasons why Allis-Chalmers motor scrapers give you more sharp-tur easy-maneuvering ability than *any ordinary units.*

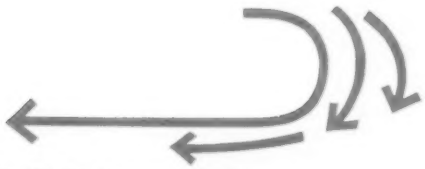
A separate hydraulic steering system assures positive power for best performance duri simultaneous steering and scraper operations. And Allis-Chalmers exclusive multiplier lin give you a big edge over any other type of steering device. Double-acting jacks *push* a *pull* for faster turn-recoveries.

Watch the TS-360, for example, excel any comparable-sized unit in turn-ability on *yo* job. Let your Allis-Chalmers dealer show you the "standing still" 180° pivot. You'll see h Allis-Chalmers *full-power steering* easily overcomes maximum turning resistance.

ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS

Safe, positive turning

Safe, positive turning



FULL POWER EJECTION

Only Allis-Chalmers all-hydraulic motor scrapers give you two-stage hydraulic ejection teamed up with the highest apron opening in the business.

The new hydraulic 340-hp TS-360 gives you a *full 10-ft. opening* from cutting edge to apron at full raise . . . higher than any other unit. With *double-barreled hydraulic power* the *360's* twin telescoping cylinders spread heaped loads without interference . . . without slowing down the cycle. Let your Allis-Chalmers dealer show you *any* Allis-Chalmers motor scraper working side by side with any other unit of *your choice.*

Bring your stopwatch, prove to yourself that Allis-Chalmers *full power ejection* is unequaled for fast, smooth spreading.

ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS

Smooth, even spreading

10 to 30 yds heaped...155 to

FULL POWER PENETRATION

Only Allis-Chalmers all-hydraulic motor scrapers give you double-acting bowl jacks that penetrate for faster loading, controlled digging.

Exclusive hydraulic down pressure on the cutting edge permits quick penetration into the toughest-loading materials. Penetrating force like this—along with Allis-Chalmers' original low, wide bowl—gives you fast, heaped loads every pass. Operators go for this precision bowl control in a big way. You will too, when you see the results.

For definite proof, compare Allis-Chalmers performance with any other motor scrapers—in any cut . . . regardless of material.

ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS

Fast, controlled loading

Quick, controlled loading

Safe, positive turning

340 horsepower...

TS 160 TS 260 TS 360

FULL POWER TRACTION

KON-TORK differential provides every Allis-Chalmers motor scraper with full-time traction magic. You get all-weather production to help meet tight schedules.

KON-TORK differential works automatically. In the cut, on the haul or soft fill, it helps boost cycle time by automatically controlling the transfer of torque to each drive wheel... giving you full benefit of *maximum tractive effort all the time.* Another nice thing about KON-TORK differential is that it's simple. Its five moving parts require no adjustment.

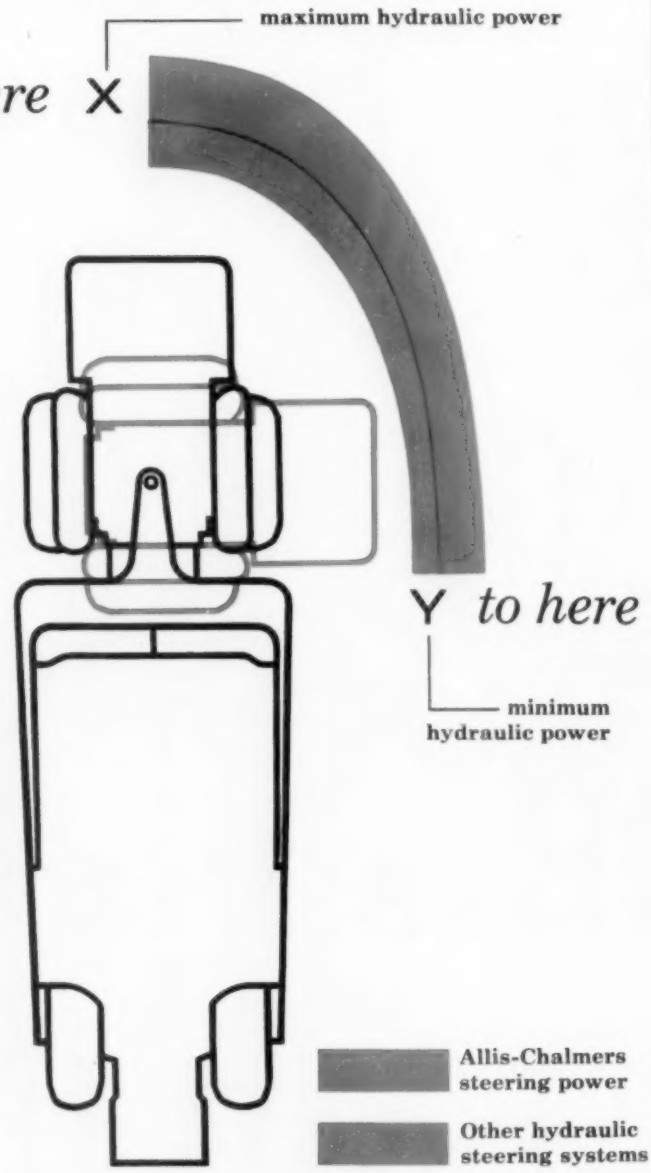
ALLIS-CHALMERS ALL-HYDRAULIC MOTOR SCRAPERS

Steady production... even in mud

Only Allis-Chalmers all-hydraulic motor scrapers give you

FULL POWER STEERING

from here X



HERE'S HOW

1. **Fast, 180-degree, non-stop turning** in less than machine length with only one-sixth turn of the steering wheel.
2. **Faster recoveries** from full 90-degree turns than any other motor scrapers.
3. **Double-acting hydraulic response** to match any situation in every phase of the cycle.

Only Allis-Chalmers motor scrapers can provide you with these exclusive advantages.

As illustrated in the graph, Allis-Chalmers hydraulics provide more turning power at point *Y—the low power point in any steering system*—than most other motor scrapers have at point *X, the point of maximum hydraulic turning effort.* The reasons: Allis-Chalmers motor scrapers provide independently powered hydraulic steering systems. And Allis-Chalmers advanced engineering has resulted in a hydraulic system which is the standard of the industry.

155 to 340 horsepower.....

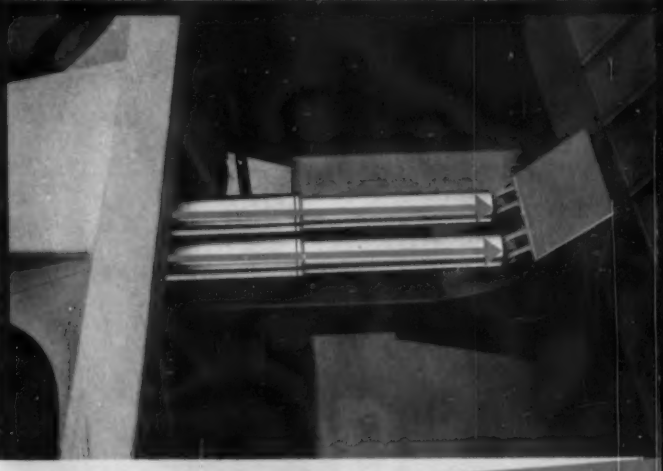
10 to 30 yards heaped.....

all hydraulic.....

Here's how full-power penetration puts enough force on the cutting edge to pivot this load clear of the ground. Only through the outstanding durability which is built into every Allis-Chalmers *seal, hose, jack, valve* and *pump* . . . can superior loading performance be realized day after day. The story is one of precision engineering and machining . . . quality materials . . . constant testing . . . and never-ending hydraulic research.

Here's how KON-TORK differential works for you every minute of the day. Whether you're loading, hauling, or spreading . . . you *always benefit* from the traction boost of KON-TORK differential. As footing conditions vary, tractive requirements are met automatically through KON-TORK differential's smooth transfer of power from wheel to wheel.

KON-TORK differential's simple, rugged design utilizes only five moving parts which require no adjustment. Try full-power traction on your job soon. You'll quickly see its big benefit—building up fast on the fill.



Here's how full-power ejection assures speedier fill work. Telescoping *hydraulic* rams provide *two-stage* ejection power. The first—and most powerful—stage forces the whole load forward. The second faster stage kicks out the remainder of the load clean as a whistle. It's no wonder Allis-Chalmers motor scrapers give you fast, even lifts every pass with *full-power ejection* . . . with *up to 2 ft. more apron lift* than any comparable-sized units.

Quick, controlled loading

Safe, positive turning

You can't afford to pass up FULL POWER EARTH-MOVING PERFORMANCE

Pick a date for a demonstration now... with the all-hydraulic machine that fits your needs best!

TS 360

340-HP 22.3 TO 30 YD

TS 260

230-HP 13.5 TO 18 YD

TS 160

155-HP 7.5 TO 10 YD

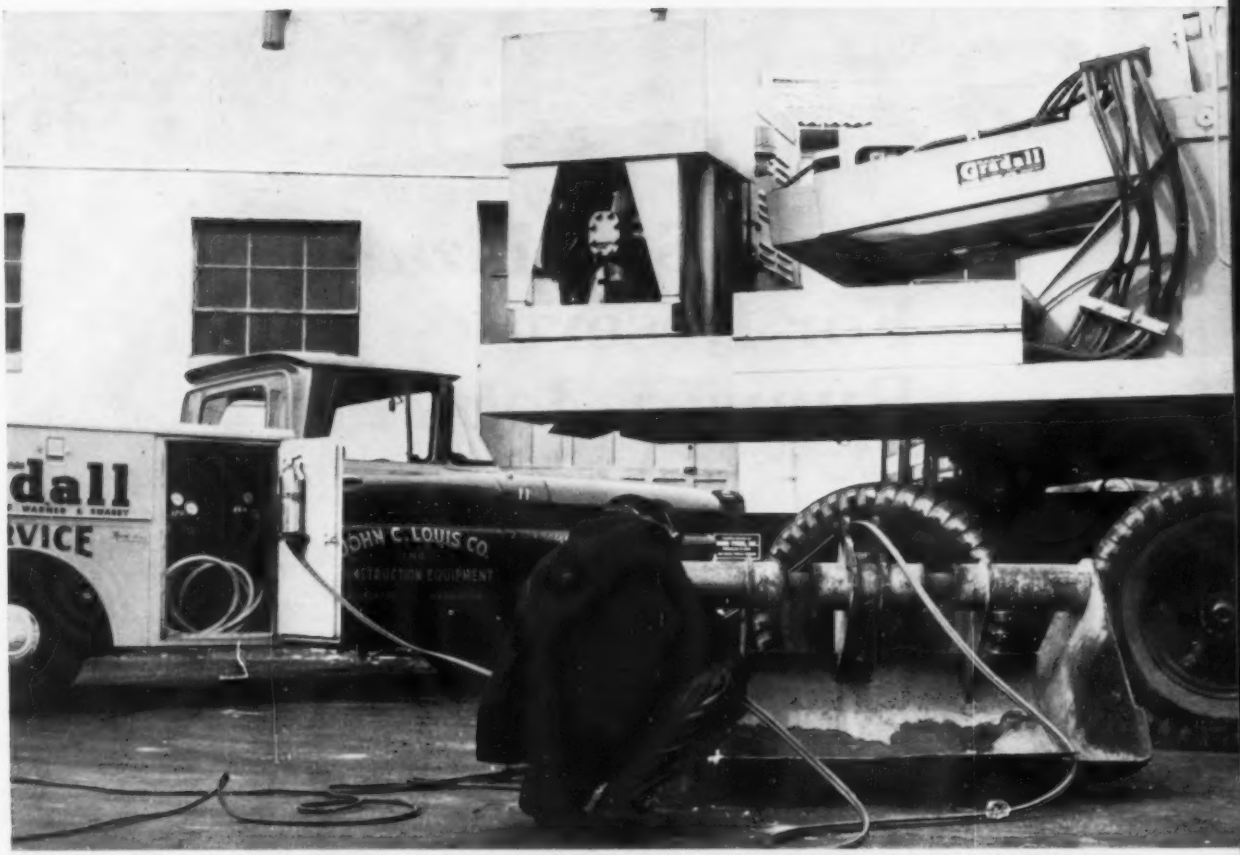
Allis-Chalmers motor scrapers have proved their capabilities on thousands of jobs ranging from superhighways to simple, single-unit stripping jobs. You owe it to your investment and your future to appraise the industry's only *full-power* motor scraper line.

Only *performance* puts profit in your pocket ... look beyond the paint when choosing your next modern earth mover. Your Allis-Chalmers dealer will be out to demonstrate on your job ... can help finance your equipment ... will back you up with service that satisfies.

ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

move ahead with ALLIS-CHALMERS
...power for a growing world

KON-TORK is an Allis-Chalmers trademark.



Welding service for bucket repair—one of many chores this truck is equipped to deliver on quick telephone notice.

Special Truck Services Gradalls

The welder is spotted in a truck bed flanked by weatherproof tool and supply cabinets.

An example of specialized maintenance service made available for one kind of equipment is that offered by John C. Louis Co., Inc., Baltimore construction equipment supplier. This company has equipped a 1960 Chevrolet Apache truck for Gradall maintenance in Maryland, the District of Columbia, and parts of Delaware and Virginia.

The truck is fitted with a Reading mechanic's body which houses facilities for electric and gas welding, burning equipment, and a reversible hydraulic pump. This pump, a 40-gal. unit from a Gradall's hydraulic system, is used to drain and conserve hydraulic fluid during repairs. The fluid is replaced by reversing the pumping unit. An in-line filter removes impurities in the process. The pumping unit is operated by a power take-off geared to the truck's 4-speed transmission.

In addition to the Miller electric welding equipment, the Docson gas welder, and the Gradall pump, the truck carries tools and a $2,000 parts inventory for field repairs.

The heavy forms were handled by an Austin-Western hydraulic crane and set in accurately prepared bed. →

Base Stabilization For Desert Runway Job

Over a half-million square yards of stabilized soil-cement makes up the subbase and subgrade of a 13,300 ft. long, 200 ft. wide jet runway and adjoining taxiways in the Yuma Desert in southwest Arizona. The concrete paving methods for this project were reviewed in July, 1960, *Roads and Streets.*

The on-the-site preparation and precise finishing of this 6-in. course involved special problems in this area where ambient temperatures in summer push 120°, surface temperatures hover near 140° and humidity drops as low as 10 percent. The contractor's answer to good moisture control and job efficiency included specialized equipment, mechanical ingenuity and fast, precise operations.

The soil-cement job was carried out by the joint venture firm of Sundt & Bevanda (M. M. Sundt Construction Co. of Tucson, and M. J. Bevanda Co. of North Hollywood, Calif.). It was part of their $4,119,000 contract for construction of a new jet runway and taxiways at the Marine Corps Auxiliary Air Station outside Yuma.

The sandy overburden at the airport site was used for the soil-cement course. This material was very fine, over 30 percent in the No. 40 to No. 80 screen area, and all passing No. 4. Where preliminary stripping and excavation had removed the sandy material, additional native material for the soil-cement was brought in from borrows alongside the runway. These pits, subsequently brought to finish grade, will provide percolative and evaporative drainage adequate for the area's annual 3½ in. of rainfall. In a few locations the percentages of course sand ran excessively high.

When this occurred selected fines were brought from the borrows to bring gradation to normal, thereby holding the amount of cement needed to a minimum.

With the subgrade at approximate elevation, finish grade stakes for the 25 ft. wide paving strips were set 25 ft. apart on a line offsetting form facings by 3 ft. Steel forms 20 in. deep were swung in place by an Austin-Western hydraulic crane, then brought to precise grade by backfilling and hand tamping. Specifications allowed a deviation in form height of only ⅛ in. in 10 ft. and a maximum departure from plan grade of no more than ¼ in. These tolerances were maintained by using a level and offset at each of the grade stakes, along with spot checking by the survey party.

Forms in place, sandy material from the borrows was dumped between the rails and evenly bladed. A form-riding Lewis subgrade planer, towed by a heavy crawler tractor, struck the material to 1½ in. above finish grade to allow for final compaction.

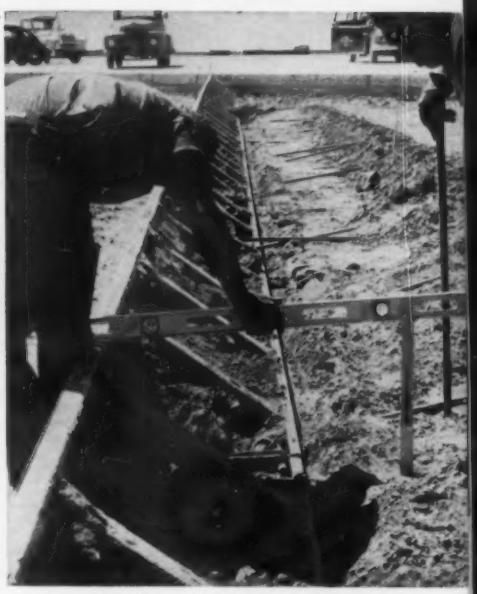
Subbase Processing Steps. The sandy material was then windrowed between the forms preparatory to addition of cement and water. Double windrowing was done by a Ko-Cal form-riding machine towed by a D9 and D8 Cat tractor in tandem. Drawing the material from approximately subgrade, the machine produced two windrows about 20 in. high and far enough apart to allow passage of the cement dispensing tanker.

The soil-cement mixture was then prepared by the addition of 6.5 percent of cement and an initial application of water sufficient to leave a damp, optimum moisture mixture. To maintain the proper moisture for specified strength development (300 psi flexure at 7 days) under the prevailing hot, dry conditions, soil-cement processing was handled quickly once the Pettibone-Wood cement dispenser had made its run down the windrows. A Pettibone-Wood single-windrow mixer, fed by a 3,500 gal. water truck running outside the forms, moved along each windrow, injecting water and thoroughly mixing material as it moved.

A Caterpillar 12 motor grader followed closely to redistribute the still-windrowed mixture. Working with the grader, a Buffalo-Springfield K-45 segmented wheel roller, carrying minimum weight, was used to both compact and remove any shear planes in the soil-cement course. The water truck's 3-in. centrifugal pump kept the material moist as the blade and

(Left): Form pins are driven by a Chicago Pneumatic hammer following final check by survey crew. (Right): Cement for mixing is dispensed by a Pettibone-Wood unit in a single pass between the two windrows.

A Ko-Cal double windrow forming machine towed by a Cat D-9 works soil-cement base material into two windrows preparatory to addition of cement and water.



(Left): Pushed by a Cat 12 motor grader, Pettibone-Wood mixer blends water, cement and soil. (Right): Last-minute form check.

roller prepared it for finish grading by the subgrade planer.

Final compaction began the moment the subgrade planer completed its final pass. A Rosco self-propelled pneumatic tire roller, running light and with tire pressure at a minimum, brought compaction to the required 98 percent (Standard AASHO) or higher in two or three passes. As the compaction tests were being run, equipment was being readied for the application of an RC-2 asphalt membrane coating, specified as a curing cover.

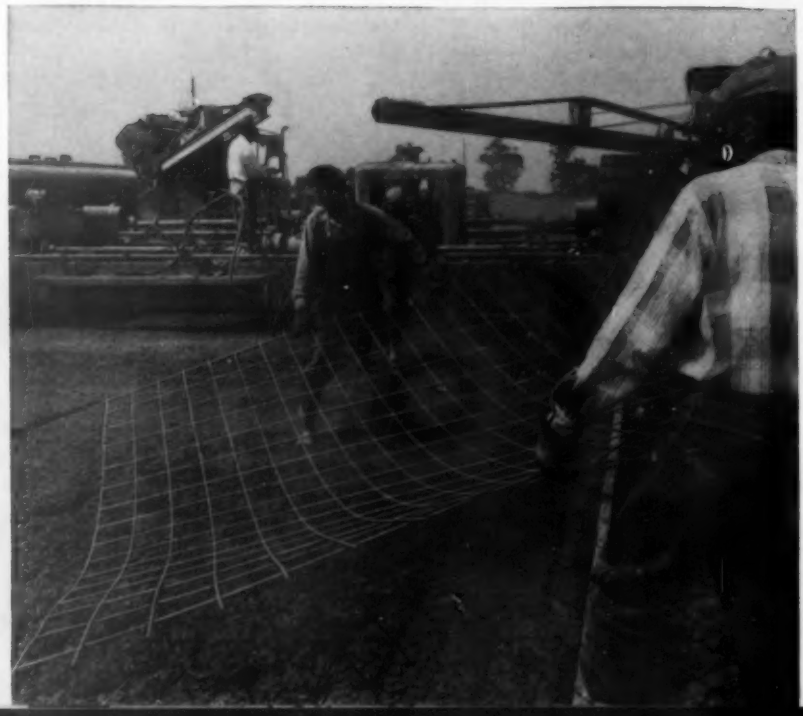
To provide a means of quickly and evenly applying this asphalt membrane at .18 gal. per sq. yd., Sundt & Bevanda built a form-riding spray bar fed by the oil truck moving along outside the forms. The spray bar was towed by the pneumatic tire roller. The membrane material, applied at 170° F, was evenly dispensed through 48 nozzles spaced along the bar and hydraulically controlled by the oil truck operator.

Special Finisher Wheels. The contractors had the usual problem of adapting form-riding equipment to permit wheels on one side to ride the adjacent poured lane. The answer was to make dual-purpose rubber-tired wheels from rubber-encased track idlers originally made for M-4 Army tanks. A center section of the heavy rubber covering was cut from the idler on a lathe; this groove was cut wide enough to accept the top of the form. Steel rings welded to the core of the idler protected the revealed faces of the rubber from wear as the bar was rolled along the form. The remaining rubber on either side of the center groove made an ideal dual tire for passage over the adjacent finished slab.

Continued on page 114

(Left): Following initial compaction by a loaded water truck, this blade trims and irons the soil-cement alongside the adjacent slab. (Center): Hopper and chute assembly cuts a 1 ft. wide by 6 in. deep trench along the strip edge and fills it to 1½ in. above finish grade with soil-cement. (Right): Final compaction being done by a Rosco self-propelled pneumatic-tire roller.

Steel reinforced ...to stand up



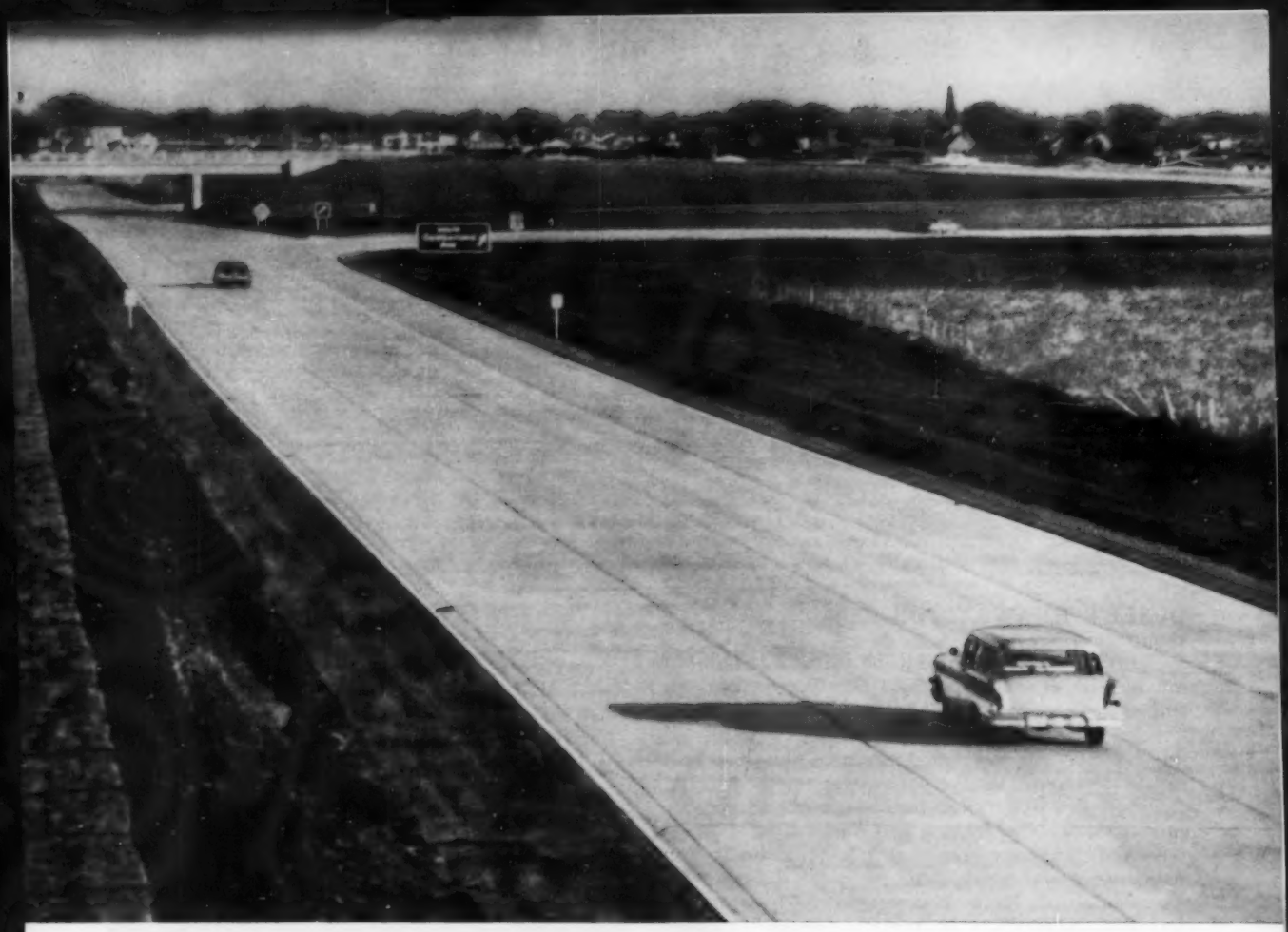
PROJECT: Portion of Northwest Expressway just west of Cumberland Avenue Interchange, Cook County, Illinois

OWNER: Cook County Department of Highways

CONTRACTORS: Arcole Midwest Corp., Evanston, Illinois

WIRE FABRIC DISTRIBUTOR: E. W. Zimmerman, Inc., Chicago, Illinois

This mark tells you
a product is made of modern,
dependable Steel.



under the hi-speed pounding of modern traffic

Cook County, Illinois has opened the first section of its new Northwest Expressway. And, like other expressways built under the authority and supervision of that county's Department of Highways, it is steel reinforced.

An anticipated daily count of 31,000 vehicles is expected on this newly opened 4½-mile section which extends from Foster & Central Avenues to the Illinois Toll Highway. This figure indicates what this already busy strip will be subjected to as the traffic load gets heavier. And it points up the importance of building into all new roads and highways the strength it will take to stand up under the almost ceaseless pounding of modern hi-speed traffic in the years ahead.

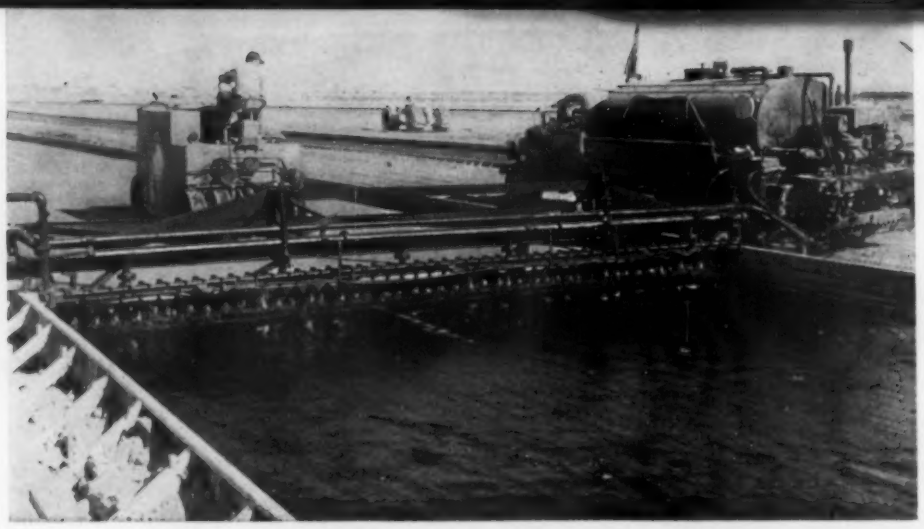
Highways reinforced with steel have a balanced design in that all edges and corners are fully protected. USS American Welded Wire Fabric accomplishes distributed load transfer and reduces stresses about 30% which accounts for the truly superior performance of reinforced concrete over non-reinforced concrete. Reinforced pavements provide a safe, smooth riding surface that lasts.

USS American Welded Wire Fabric is today stronger than ever. Minimum tensile strength is now 75,000 psi and minimum yield point is now 60,000 psi. It has reserve strength for heavier pounding and it is available in a completely machine fabricated form, ready for immediate placement. For more information, write to American Steel & Wire, 614 Superior Avenue, N. W., Cleveland 13, Ohio. *USS and American are registered trademarks*

. . . for more details circle 348 on enclosed return postal card

American Steel & Wire
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



Towed by a Rosco roller, this form-riding spray bar, built especially for this job applies .18 gal. per sq. yd. of RC-2 membrane coating through 48 nozzles. The distributor traveling outside the forms pumps to the spray bar at 170° F.

DESERT RUNWAY JOB

Continued from page 111

Unique S-C Strips. In addition to the half-million square yards of soil-cement used as a base for runway and taxiway paving, another 70,000 sq. ft. of 6-in. soil-cement was required in a 12-in. wide strip alongside the new runways and taxiways. This shoulder strip was placed after the paving was completed. Its quick construction called for fabrication of special units for material placement and compaction.

Both of these units were built in Sundt & Bevanda's maintenance and repair shop under the direction of master mechanic Banks Bourgess on the basis of design ideas worked up by project manager, Nelson "Pat" Richardson. One machine was for simultaneous cutting and filling a 12-in.-wide trench in the subgrade. The other was for planing and compacting the soil-cement. Both machines were towed along by available equipment.

The initial step of opening a 6-in. deep by 12 in. wide trench was performed using a 6-yd. steel hopper with a steel chute extending down to 1½ in. above finish grade of the soil-cement. The chute was faced with an angled blade that gouged out the material. The hopper, chute and blade assembly rode on two rubber-tired wheels running along the adjacent slab. The unit was propelled by a grader, the operator using his blade to hold the unit snug against the runway edge. The soil-cement mix, previously prepared by the Pettibone-Wood pugmill mixer stationed centrally, was fed into the hopper with a Michigan loader.

The finish grading and compaction of the strip were handled by a planing and compaction skid, mounted on a wheel tractor, following the hopper unit along the runway. This simple device had a blade that peeled excess soil-cement from the adjacent slab edge at the same time that it planed the finish grade—it included a steel skid which compacted the course as the unit moved along.

The mixed windrows are bladed and compacted by a segmented wheel compactor running light. Fast action is needed at desert temperatures to prevent loss of set.

Mixer catches up to steel-wheel roller and spreader in a tightly-timed operation.

In-Place Blending Helps Get 100% Base Density

A five-machine combination, keyed to the idea that mechanical blending aids higher compaction with less effort, has been set up to meet base-course compaction specifications for a major highway interchange at Springfield, Virginia. Key unit on the compaction team is a rotary mixer.

The interchange will serve the existing divided Shirley Memorial Highway, known as Route 350, and the now-building Washington Circumferential Highway. The latter will circle the District of Columbia through two states at a radius of about 12 miles.

Engineering design of the interchange was complex. In a space less than two miles square, the layout called for nine major bridges, 11 multiple 10 x 10 box culverts, more than 2,000,000 cu. yd. of earthmoving, and about 8 miles of reinforced-concrete paving for main roadway and access roads.

A rush schedule aims for midsummer 1961 completion. One hampering factor for the joint venturer, Hechler Bros. of Highland Springs, and Talbott-Marks of Clarksville, Va., is the heavy commuter traffic which

First step: Cat 12 motor grader making final dressing of subgrade to receive subbase material.

Placing of subbase begins as a Jaeger spreader places aggregate for 9-in. lift, 12-ft. wide.

American Marietta Pulvi-Mixer takes half the 12-foot-wide lift at a pass; leaves blend of aggregate particles and moisture. There's no headroom problem under overpass structures with this machine.

jams the Shirley Highway morning and evening.

The fills and cut bottoms in the local silty clay are compacted to 100 percent density. Atop template grade a 6-in. layer of crusher-run gravel is being placed and compacted to 100 percent, to receive the 9-in. reinforced concrete pavement slab.

Crusher-run material for this layer is obtained from quarries about 10 miles away, and stockpiled by the contractors. This Virginia Class 1 aggregate contains about 30 percent fines and stone up to 1-in. maximum.

Here's the way W. R. Jones, grading superintendent, has set up his machines to meet these specifications:

After the fill has been finish graded by a Cat 12, the crusher-run stone is brought in from stockpiles by truck, and put down in 12-ft. wide, 9-in. lifts by a Jaeger spreader. A 12-ton steel wheel Austin-Western roller works close behind to compact the material into a reasonably firm surface, so that it can serve as a guide for the next machine, an American-Marietta Pulvi-Mixer.

Water to bring the material up to optimum is then added by a sprinkler truck. The mixer moves behind quickly so the water never has a chance to get away.

Its deep-digging rotor sends tine points down 9 in. through the material, delivering a thorough mixing and blending action. What this does, in effect, is to get rid of any segregation from hauling and dumping, and to arrange particles with much better evenness. When the mixing is done, the fine particles fit better between the coarse material particles as the rollers do their work. Higher compaction with a minimum of compactive effort has been the goal, and this has been achieved.

Compaction of this gravel material is far from easy, even so, because of the 100-percent density requirement. Without the rotary mixing and blending, it would be much more difficult.

Compaction begins when the steel-wheel roller makes an initial pass over the blended material. This firms up the surface enough so that a self-propelled pneumatic can pull its weight through the mixed material. Pneumatic rolling then continues until the design compaction is reached. Density tests are made by the engineers as the work goes on.

This simple procedure is to be followed, say project officials, in placing all of the estimated 48,000 cu. yd. of crusher-run material in the project. This will include material for shoulders as well as stabilized roadway base.

Cement Association Wins Mill Safety Award

The Portland Cement Association recently was named a winner of the National Safety Council's Association Award for 1960.

It was one of 10 associations, representing various industries in the United States and Canada, cited by the Council for excellence and balance in their safety programs and above-average progress in accident prevention in the manufacturing plants of the association's member companies.

OCT. 20, 1952: 4" SNOW—WILKES-BARRE-SCRANTON, PENN.
OCT. 10, 1954: 6" SNOW AND SLEET—CLEVELAND, OHIO
OCT. 25, 1955: FREEZING RAIN—CHICAGO AND DETROIT
OCT. 24, 1956: 3" SNOW, FREEZING RAIN—SOUTH DAKOTA
OCT. 18, 1959: 3" SNOW—NORTHERN NEW ENGLAND

(Source: U. S. Weather Bureau Climatological Data)

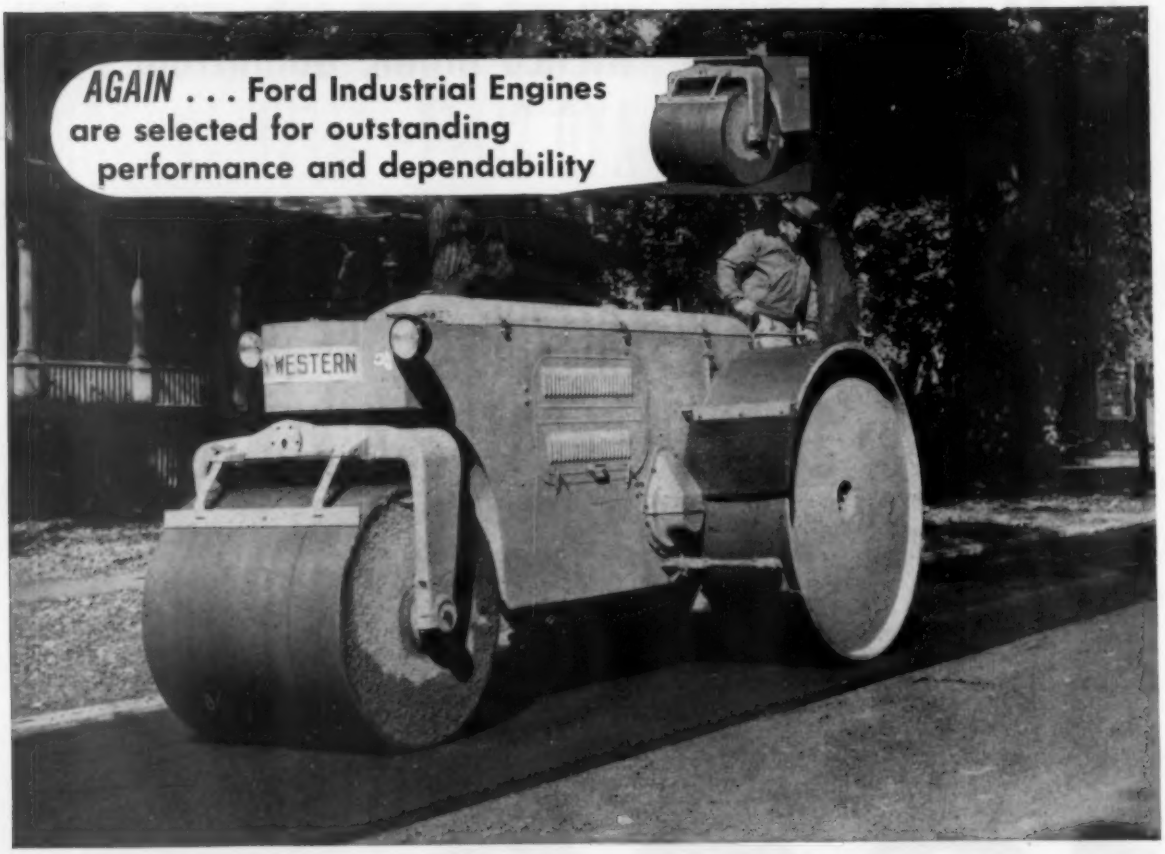
1960?

Prepare for early storms—
order STERLING ROCK SALT now

If you're caught without rock salt, early storms can paralyze traffic, cause serious accidents, mean heavy business losses. Don't let this happen to you! Stockpile your Sterling Rock Salt now and stockpile enough. (When treated with Storite, Sterling Rock Salt can be kept from caking even in outside storage.) Order *now* from your nearest International Salt Company sales office.

INTERNATIONAL STERLING SALT SALT COMPANY
"A STEP AHEAD IN SALT TECHNOLOGY"
BUFFALO • BOSTON • CHARLOTTE • CHICAGO • CINCINNATI • DETROIT • NEWARK • NEW ORLEANS • NEW YORK
PHILADELPHIA • PITTSBURGH • ST. LOUIS • HEADQUARTERS, CLARKS SUMMIT, PENNSYLVANIA

. . . for more details circle 320 on enclosed return postal card



Ford-powered roller provides smooth, steady 14-ton *"squeeze"* for road binding operation!

Whatever the material—crushed stone, soil cement, or blacktop—the Ford-powered Austin-Western 3-wheel roller is built to make short work of any compacting job. And just as Ford power contributes to the effectiveness of the Austin-Western roller, a Ford Industrial Engine can bring a new kind of efficiency to your construction equipment.

Ranging from 134 to 534 cubic inches, Ford engines offer a host of modern durability features such as Short Stroke design to reduce friction and wear . . . Deep-Block construction for smoother performance . . . and full length water jackets for better cooling and longer engine life. With features like these, Ford engines now give you *more horsepower per pound of engine weight than ever before possible.*

All Ford engines, including Ford's two highly economical diesels, are available as complete assemblies or power units. Because these engines can be serviced by any nearby Ford Dealer, you can keep downtime to a minimum *wherever you go.*

So to be sure you get the most for your power dollar, specify modern Ford Industrial Engines for your construction application.

FORD POWER IS RIGHT FOR YOUR EQUIPMENT, TOO!

Ford
INDUSTRIAL ENGINES
AND POWER UNITS

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to: → FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF.
→ FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

. . . for more details circle 304 on enclosed return postal card

HOW MANY SCRAPERS

Continued from page 85

production the cost is $\frac{\$17.00}{108 \text{ cu yd}} = \$0.157$ per cu yd, which is higher than the cost of $0.143 per cu yd obtainable by using 5 scrapers.

Since the cost of equipment is the major item in the cost of handling earth, a contractor should devote some time to analyzing equipment performance and operating conditions, this is a means of reducing the cost of handling earth. Any contractor who does this, and, as a result is able to effect a reduction in the cost of doing work, is in a strong bidding position. Under the competetive conditions which exist today a positive reduction of five percent in the cost of doing work can be very attractive.

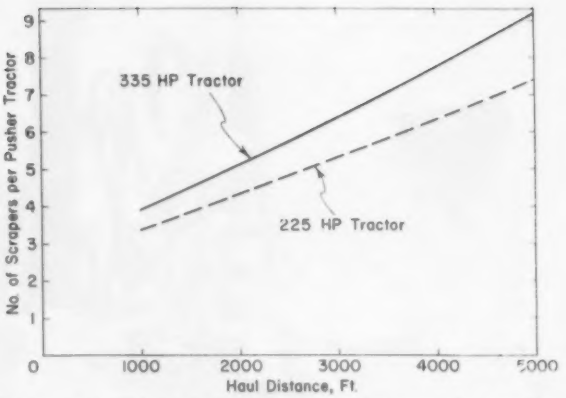


Figure 2. Number of scrapers that can be served by a push tractor.

Traffic Safety

Connecticut Studying Barrier Installation

The Connecticut state highway department is investigating the cost of installing median barriers in the state's older divided highways, according to highway commissioner Howard S. Ives. He said the department had been prompted to investigate the cost in view of a recent increase in median crossing accidents. Financing recommendations may be submitted to the next state legislature.

Concern is centered in the older divitled highways with a center strip of 20-ft. width or less. Under the plan contemplated a continuous metal beam rail barrier would be installed on the narrower center strips to prevent autos from jumping into the opposite lanes.

Critical highway areas will have barriers installed immediately without waiting for the report to be concluded. The survey report will set up priorities for other highway sections requiring the improvement.

Insurance Institute Names Traffic Consultants

Three traffic consultants have been added to the staff of the Insurance Institute for Highway Safety, Washington, D.C. James Latchaw of West Liberty, Iowa, John E. Smiley of Trenton, J.J., and William J. Toth of Woodhaven, N.Y., will serve in the IIHS technical traffic assistance work in selected states. Latchaw will specialize in traffic law enforcement, Smiley in accident records, and Toth in public safety education.

The Institute, established early last year, spearheads the first industry-wide traffic safety activity in the casualty insurance field. It was formed by the Association of Casualty and Surety Companies, the National Association of Automotive Mutual Insurance Companies, and the National Association of Independent Insurers.

N. J. Turnpike Extending Its Median Barriers

The New Jersey Turnpike Authority has taken another major step in its program for greater traffic safety along the 131-mile toll road. Bids were taken recently for erection of a median barrier along the remaining 75 miles now lacking this protection.

The project calls for the construction of a galvanized steel or aluminum guard rail median barrier between Milepost O at Deepwater and Mile 90 at the Garden State Parkway Interchange No. 10. A median barrier presently exists for about 15 miles between those two points.

Contractors also bid on four contracts providing also for a reinforced concrete barrier along two bridges at the Raritan River and at Cranbury. All other turnpike spans will get the metal guard rail. In addition, a single guard rail will be installed at selected locations along the sides of the turnpike for a total distance of four miles.

The contracts will entail 396,000 lin. ft. of double guard rail, 1,100 ft. of reinforced concrete median barrier, and 140,000 sq. yd. of macadam median surfacing.

Turnpike to Install Warning Reflectors

Erection of green and silver diagonally striped reflectorized warning panels on piers of 25 bridges along the New Jersey Turnpike was authorized by the Turnpike Authority. The project is expected to begin this summer.

The warning panels, 12 ft. high, will be appended to bridge supports in the right-hand and medial isle driving lanes on road. Turnpike safety engineer John Crosby said the panels are designed to help break the monotony of driving the 131-mile road. It is hoped that the flashing colors will help keep drivers from dozing, he said.

For the last two years, various panel designs have been tested at the New Brunswick overpass. Estimated cost of the "Scotchlite" panels is $75 each. Initially, 100 panels will be erected on 25 structures in the central section of the road. Future plans call for extension of the project to the more than 100 bridges and overpasses that cross the superhighway.

Operating auger—note easily accessible position of controls.

Hollow stem auger unit with derrick in travel position.

Illinois Steps Up Borings for Bridge And Fill Sites

Modern boring rigs aid subsurface exploration for design and construction planning

By E. L. Sherertz

Engineer of Design, Illinois Division of Highways, Springfield

Obtaining adequate subsoil information for the design of bridge and traffic structures, culverts, deep cuts and high embankments for our highway program was, until recently, a major problem in Illinois. The problem was compounded by the growing realization by our engineers of the importance of complete and accurate subsoil information for safe and economical bridge and highway design; and the consequent demand for a more extensive and comprehensive soils exploration program.

Before the advent of the Interstate program, bridge boring work had largely been done by two crews operating out of the Bureau of Design in Springfield. With the increased volume of such work including the needs of Interstate projects it became necessary to initiate a crash effort. Initially this meant contracting with various outside agencies for much of the work on a more or less hand-to-mouth basis. It soon became apparent that this was less than satisfactory as a permanent long range policy.

A study was conducted in 1958, to ascertain how the increased volume of boring work could most economically and efficiently be handled. In addition to the normal bridge boring work, consideration was given to research and emergency assignments and investigative work to determine the stability of deep cuts and high embankments, which were becoming increasingly common on highways built to Interstate standards.

It was decided to reorganize and expand the bridge boring organization as follows:

1. Obtain additional equipment and handle all boring work requiring deep boring equipment within the Division.

2. Transfer the responsibility for this work from the Bureau of Design to the highway districts.

3. Retain one unit in the Bureau of Design to do over-water work requiring flotation equipment, and research and emergency work.

There was to be no change in the policy for making highway soils surveys by district personnel with their existing light boring rigs.

The chief highway engineer, R. R. Bartelsmeyer, appointed a committee of engineers on January 20, 1959, to investigate the available structure boring equipment and write specifications for its purchase, train personnel in the use of the equipment, and in general set up a state-wide structure boring organization. Dr. H. O. Ireland of the Soils Mechanics Section, College of Civil Engineering University of Illinois, served on this committee in an advisory capacity.

After a thorough investigation of the available equipment, it was agreed that the best unit for our purposes would be a truck-mounted hollow-stem auger-type unit. It was felt that a truck-mounted unit would be more practical and mobile both on and off the highway than a trailer-mounted unit, and that the hollow-stem auger-type equipment was the most efficient and economical type available for the following reasons:

1. The hollow-stem auger serves as casing for the hole, thus eliminating the need to drive casing.

2. The need for drilling water is eliminated in many cases.

3. Increased speed of operation.

4. Increased economy of operation.

Specifications were prepared for nine custom-made units, incorporating all features that we consid-

Unit in operation on bridge job.

ered desirable, but still broad enough to insure bidding competition.

The vertical drive mechanism was to have a downward thrust of 9,000 lb. and a withdrawal of not less than 10,000 lb. The length of vertical travel was to be at least 5′ 8″ and the maximum rate of retraction at least 14 ft. per minute.

The drill assembly was to be mounted on a sliding base so that the drill unit may be moved horizontally, hydraulically off the drill hole.

The hydraulic pump was to be a heavy duty power driven pump, run independently of the gear train, and with a capacity of not less than 16 gpm at 1,000 psi.

The cat head winch was to have 6 to 8 in. drum diameter with a peripheral speed controllable between 150 to at least 350 ft. per minute.

The drill power unit was to be a gasoline powered, water-cooled heavy duty industrial type engine, having not less than 220 cu. in. displacement, having sufficient power to drill seven inch diameter continuous flight augers 100 ft. into material other than rock.

The truck-mounted derrick or drill tower was to be a hinged type raised and lowered by hydraulic power, high enough to easily suspend 20 ft. of auger plus the auger head, and strong enough to withstand a maximum withdrawal load of 5,000 lb.

The truck was to be a four-wheel drive truck, with a 6-cylinder engine having not less than 260 cu. in. piston displacement, equipped with power steering, front-end mounted winch, and a distance from cab to rear axle of 102 in. to accommodate the body with the drilling equipment, to be mounted by the drill vendor.

Two hydraulic powered leveling jacks, individually controlled, were to be mounted on the rear corners of the truck bed to provide adequate leveling ability for the loaded truck while the drill is in operation.

The accessory equipment was let by separate contract and included for each drill unit: 75 ft. of continuous hollow stem auger (2¾ in. I.D. and 5 ft. length auger sections) and various couplings, adaptors and AW rods, etc.; core barrels, Split Spoon Samplers (2 in O.D. and 1½ in. I.D.) and Shelby Tube Samplers. For making the Standard Penetration Test a 140-lb., 30-in. stroke integral safety hammer was specified; and for field testing the cohesive samples in unconfined compression a Rimac Spring Tester was specified. (Actually this is an automotive valve tester and was to be modified in our machine shop.)

Three companies submitted bids, for the units, and the contract was awarded to the low bidder, Mobile Drilling Company, of Indianapolis, Indiana. The unit they proposed to furnish was their Model B-52 Pacemaker, mounted on an International truck, Model B-160. Both the drilling units and the trucks were to be modified to meet our specifications. As the units were custom made the manufacturer prepared a pilot model which was inspected by our personnel and modified to meet our suggestions before the remaining eight units were produced.

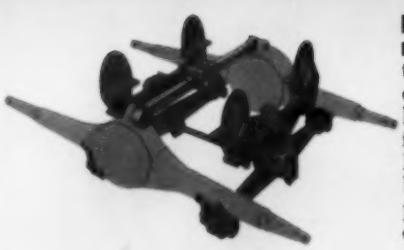
The first unit was delivered to

Continued on page 127

SMART CONTRACTORS ARE MOV

V6

Today's truly modern truck power—America's first and only V-6 gas-powered truck engines! Designed and built to out-perform, outlast previous engines . . . save you big money on operating costs. You get full, usable torque at low, life-saving rpm. Friction and wear are reduced. Fuel mileage is increased. V-6 horsepower from 150 @ 3600 rpm to 205 @ 3200 rpm. Torque from 258-260 @ 1400-2200 rpm to 375-377 @ 1200-2000 rpm.



Bigger payloads, less maintenance – With this new GMC tandem suspension, you have less truck weight for bonus payloads. Rubber mounts and bushings at all wear points practically eliminate servicing.

- **Larger, sure-stop vacuum or full air brakes.**
- **Power-Mated drive trains.**

See your GMC Dealer listed in the Yellow Pages for all the facts.

Cut job time, haul bigger loads with new GMC BW5500 Series six-wheelers. Join the contractors that are profiting from the superior performance of the exclusive 401 cubic-inch V-6 engine, larger clutches, better weight distribution with 90" BBC . . . all the advanced features that have made this the most-wanted GMC construction truck. Other models to 120,000 lbs. GCW with Twin-Six gas and V-6 diesel power.

VING UP TO NEW GMCs!

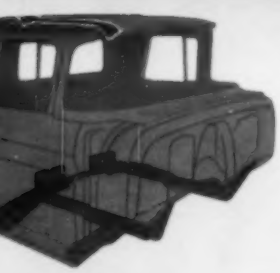
SEE WHY CONTRACTORS' FAVORITE GMCs ARE YOUR BEST TRUCK VALUES, TOO!

GMC
GENERAL MOTORS CORPORATION
TRUCKS

PULL HERE

From ½ ton to 60 ton . . .
General Motors leads the way!

Now, GMC has achieved the BIG BREAKTHROUGH in engine, chassis and cab engineering! Results: The most advanced trucks in 20 years . . . the trucks that completely answer the needs of today and the future. Trucks that last you far longer, require far less maintenance. See for yourself.



Extra-rugged cabs—All new GMC cabs have built-in reserve strength throughout . . . extra reinforcements and sturdy sills at all stress points to take the toughest construction jobs longer.

New design, stronger, high-tensile steel frames.
Exclusive easy-to-service design.

GMC Truck & Coach—a General Motors Division—Pontiac, Michigan

On the go to cut concrete expansion joints and fill with tar—this GMC steel tilt-cab is loaded to full 23,000 lbs. GVW. New L4000 Series have unsurpassed flexibility. For example: you have a choice of 20 axle-transmission combinations with standard 150 hp. and optional 165 hp. or 185 hp. V-6 engines. Vacuum or full air brakes available. Easy-driving independent front suspension with torsion bar springs standard.

NEW GMC TILT-CABS ARE . . .

EASIER TO DRIVE

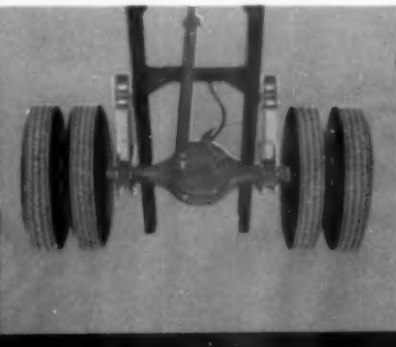
New steel tilt-cabs have front axle set-back 52 inches and short wheelbases to give you up to 25% shorter turns (small as 33.6 feet) for quick, easy handling in crowded areas.

EASIER TO SERVICE

Cut service time and costs. Now you can walk right up to the engine with the cab tilted. And with all GMC tilt-cabs, controls are in perfect alignment and adjustment at all times because they are not disconnected —due to the stationary control island.

BUILT TO LAST

New design frames are stronger and more rigid. New, standard 3-inch wide vari-rate rear springs with built-in radius-rod leaf last longer . . . everything for lasting dependability.



Tight schedules, round-the-clock construction jobs call for dependable GMC Trucks. This popular 5000 Series Conventional with 105″ BBC dimension keeps cycle time down, profits up with exclusive, high-torque 180 hp. V-6 engine, balanced drive train and uncompromising ruggedness throughout. Full line of Conventional construction trucks completely covers the range from ½-ton pickups to this 25,000-lb. GVW dump.

ONLY GMC CONVENTIONALS GIVE YOU...

EXCLUSIVE V-6 ENDURANCE

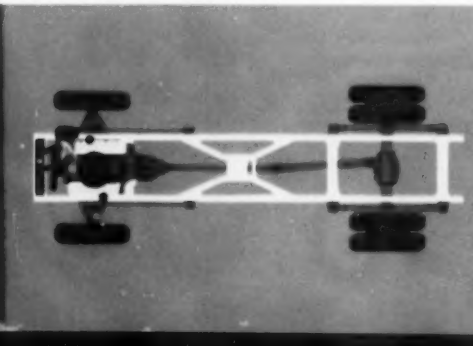
Now you have a potential of up to 200,000 miles without a major overhaul, with the proper maintenance and use. This is backed up by grueling, accurate engineering tests.

CUSTOM GEARING

With GMC Power-Mated drive trains, every component from the larger clutch to the high-strength axle shafts is properly sized and geared for your specific construction haul . . . balanced and built for increased durability.

SPECIALIZED STRENGTH

New X and K-type frame designs greatly increase torsional rigidity for reserve load-carrying ability. New, stronger, upright L-type reinforcements.



BRIDGE AND FILL SITES

Continued from page 122

the Springfield district in January, 1960, and the last one to the Carbondale district in March. A demonstration was put on by the manufacturer's team for the District Materials and Soils Engineers in Springfield, and instruction was given the operating personnel as each unit was delivered.

Job descriptions for the boring personnel were prepared by the committee as an aid in assigning qualified personnel to the units. In general, the units were organized as follows:

1. A "District Boring Engineer" directly supervises the boring crew and in turn, operates under the general supervision of the District Soils Engineer in the District Bureau of Materials. This individual is a Civil Engineer II or III, with background work in soils mechanics, geology, or foundation engineering. In addition to supervising the normal duties of locating and determining the number and depth of drill holes, sampling, testing, etc., he is responsible for recognizing unusual or inferior subsoil conditions, and the investigation and preliminary analysis of such soils.

He is assigned to the crew on a half time basis and is available for supervisory duties in other soils operations in the field, laboratory or office.

2. A "District Drilling Technician" is assigned full time to the crew, and in the absence of the Boring Engineer assumes his responsibilities. He actually performs all the technical duties such as sampling, testing, etc. His classification is that of Engineering Technician III or IV. Many of our drilling technicians are graduate geologists.

3. Two crew members.

A short course was held at the University of Illinois on March 15, 1960, to instruct the personnel in the techniques and procedures of obtaining, testing, and classifying the samples, preparing the boring logs, making field stability analyses to determine the need for obtaining undisturbed samples for laboratory testing, and obtaining such samples.

A "Field Boring Manual" was prepared as a guide for the field personnel and contained information on the following subjects:

1. Location and depth of borings for bridges, and for embankment and cut stability analyses.

2. Preparation of the boring log which is a standardized report from the Boring Engineer in the field to the designer in the office, in which the physical properties and arrangement of the subsoils are described: ground water depth, elevation of ground surface and of each successive soil strata; description of sample (taken at 2.5-ft. intervals) in order of relative density or consistency, color, geological origin, textural classification, etc.; blows per foot, "N", from the Standard Penetration Test, "Qu" or unconfined compressive strengths of cohesive soils; water content, etc.

3. Classification of the sample, including descriptions of various kinds of rocks, classification of sands and gravels depending on grain size, classification of soils by the trianguar textural classification chart, field identification of clays, silts, etc. and geological classification of soils.

4. Sampling and testing, including discussion of the techniques of Split Spoon and Shelby Tube Sampling, performing the Standard Penetration Test and field testing for unconfined compressive strength.

The manual includes a chapter on slope and embankment stability problems. It is considered important that all such potential problems be recognized at the time of the soils investigation and undisturbed samples taken of the subsoil for laboratory analyses in the Bureau of Materials laboratory in Springfield. A procedure was developed to enable the personnel to determine in the field with the minimum of time if there is a possi-

Making Standard Penetration Test. Note leveling jack in lower right corner.

bility of a deep-seated failure for a given embankment and subsoil condition. This procedure is based on equation 31.2 for determining the factor of safety for a circular arc type of failure from "Soil Mechanics in Engineering Practice," by Terzaghi and Peck:

$$F.S. = \frac{\text{moment of total resisting forces}}{\text{moment of total driving forces}}$$

If the computation reveals a factor of safety of less than 2.0, undisturbed samples are obtained for laboratory testing and a more refined analyses.

To insure that the boring information will be available to the designers when needed a policy was set up to schedule the boring work before the final planning, and design of a project.

As the final step in the project a short course is being organized to give the bridge design engineers additional training in the interpretation of the boring logs and the use of this information to properly design bridge foundations, retaining walls, etc.

It is our thought that the Illinois Division of Highways now has a bridge boring organization made up of well trained personnel equipped with the most modern equipment, that can very efficiently and effectively handle all bridge and deep boring work for the Interstate program as well as our own.

Special Screed Handled Deck Job

Two vibrating units assured thorough consolidation during strike-off. Note raised ends of screed, which is carried on a raised rail outside the slab width.

Structures Incorporated and Ballenger Paving had the problem of striking off and screeding 1 to 1½ in. slump concrete on a 28-ft. span. The bridge was for a job near Highway 29 North, Athens, Georgia. The work was done with a Stow vibrating screed modified for this project; its rails were set farther apart than the span width to be screeded and set 10-⅜ in. above the slab surface. The rails were 34 ft. 3 in. apart.

An underslung type construction (see photograph) was used so that the screed rollers could be located on the rails to support this beam. Also due to the length, the screed's adjustable crown assembly was put in the center of this beam so that the beam could easily be set for the ¼-in. crown required. Two power units were used to assure ample vibration throughout the screed's length.

The slab was skewed on a 45 degree angle, which would ordinarily make it impossible to screed the triangular deck area. This problem was met by extending the rails beyond the slab. A plastiment agent was used to retard the setting up of the concrete some three to four hours.

A Stow Model HC-175 Hy-Cycle vibrator with a 1-¾-in. vibrating head was used in concrete as it was placed ahead of the screed. After 20 to 30 ft. had been placed, the vibrating screed was started up and pulled along the slab surface.

Grade with inch-close accuracy by loading from the bottom with scraper action. Change depth of cut by rolling bucket forward or backward while riding on the exclusive Skid-Shoes.

Open the bucket all the way and you have an efficient bulldozer. Proper curvature of moldboard, which also serves as the back of the bucket, gives a "live" rolling action.

Famous **Four-in-One**

unlimited job range... now in a

¾ yard economy size!

For thousands of dollars less than ever before you can have the exclusive Four-in-One and its extra profit potential. With either the International® T-340 or the powerful new TD-340 Diesel, you get earning capacity you never could get before in a ¾-yard rig.

The Four-in-One is so much more than a loader . . . it's a carry-type scraper, a clamshell, and a bulldozer, too! Simply move the machine selector lever to match the tool to the job. You handle a wider range of work than ever before possible with a tractor loader this size.

You get more power than with other crawlers in this size class . . . 47 hp* for the T-340 and the TD-340 Diesel. Greater power and higher working speeds allow you to outwork all other ¾-yard loader tractors. Fast Reverser gives you five speeds coming and going, with a 22½ per cent speed increase in each reverse gear range. Operating costs are low because of famous International tractor rugged dependability and proven fuel economy.

**Maximum engine horsepower at standard conditions.*

Multiply your job range by four! Broaden your profit opportunities. See your IH dealer for a demonstration of T-340 or TD-340 Four-in-One extra earning capacity today.

International Harvester Co., Chicago 1, Illinois

Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL DROTT

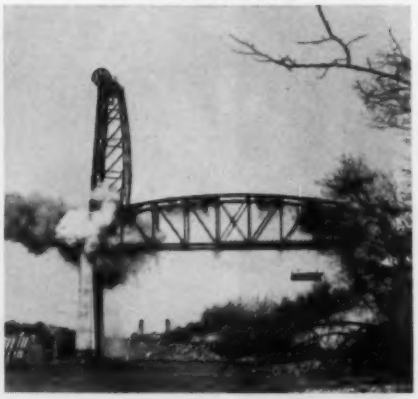
Spot-place your loads . . . increase your reach by dumping from the bottom. Gravity draws out sticky materials that clog the corners of conventional buckets.

"Surround" loose materials instead of chasing them. Clamshell action grabs a full bucketful cleanly and quickly . . . and your tractor never moves from one spot.

Loading south span and tower in high wind was tough work. Telescopic shot shows Loizeaux (lower man) taping charges in place while assistant handed him additional gelatin.

All Set Boom!

2 Seconds



5 Seconds

Careful Blasting Removes Old Lift Bridge

The rapid demise of the 900-ft.-long lift bridge that carried Route 896 over the Chesapeake & Delaware Canal at Summit Bridge, Delaware, was carried out in four distinct stages. The outstanding features of its demolition were the minimum of workmen on the job, a good safety record, and some of the fanciest blasting ever staged.

The 35-year-old steel structure was already replaced with a modern high-level fixed bridge located a mile away. The old bridge was first attacked by a dynamiting crew that quickly fractured the two large concrete counterweights into rubble with a series of fractional stick loadings. The debris was removed by a Hough Payloader. The 200-ft.-long movable center span, sans counterweights, was then held aloft with cables to either shore.

The next dismantling step was considerably more ticklish. A Hughes Bros., Inc., barge, 125 ft. by 75 ft. with 14 ft. draft was anchored directly beneath the bridge. The cables supporting the center span were attached to building hoists: two Jaeger single-drum hoists on the south bank and two Skagit double-drum hoists on the north bank. The building hoists were anchored to deadmen—steel beam sections buried 6 ft. down.

With a man placed on each end-span to relay signals to the four hoist operators, the center span was cut loose from its two tower channels and lowered smoothly to the barge over 100 ft. below. The coordinated 4-hoist lowering operation took about 40 minutes. Loaded with the cumbersome center span, the barge was then towed to a salvage yard in Baltimore Harbor, some 60 miles distant, by two tugs supplied by Harbor Towing.

The last two steps in the demolition plan involved the razing of the north and south towers and end spans. They were identical, each consisting of a tower 183 ft. high in the canal, and a 194-ft. truss and 150-ft. wooden trestle connecting the tower to shore.

The removal of the center span had precluded the use of a heavy crane on either of these end spans—they simply would not support it. But the big sheaves atop the towers could not be lowered manually without a crane. The final decision: chop down each tower and end span as a unit with explosives.

This was to be ticklish work. The towers *must not* drop away from the bank and block the canal to shipping, and the sheaves had to drop in a readily accessible location. The south span and tower were attacked first. The high winds whistling through the canal cut made loading tough for the dynamite specialist and his two assistants. The bridge deck had been removed and footing everywhere was hazardous. The stiff wind also dried out the DuPont 100 percent nitroglycerin gelatin so

Continued on page 133

6 Seconds

8 Seconds

11 Seconds

MAKES YOUR STREETS SAFER, YOUR JOB EASIER!

Public safety is the basic reason for salting streets and highways. Morton Safe-T-Salt* is a product named to explain this function to the public. Morton Safe-T-Salt makes your job easier because it constantly reminds the public of the primary reason for salting treacherous pavements and helps promote what you do to reduce the hazards of winter driving.

Designed to meet your specifications, Morton Safe-T-Salt is a screened, graded, economical rock salt that makes your streets and highways safer by ridding them of dangerous ice and packed snow—quickly and thoroughly. Morton Safe-T-Salt gives *immediate abrasive traction* against skidding, *penetrates deep ice* and *quickly melts* the bond between ice and street surface.

Safe, clean, economical—Non-toxic and easy to handle, straight Morton Safe-T-Salt will not clog sewers or leave a rutted dirty pavement as will sand and cinders. Moreover, rock salt *melts more ice at lower cost* at any temperature above 8° F. than any other commonly used ice melting chemical or abrasive.

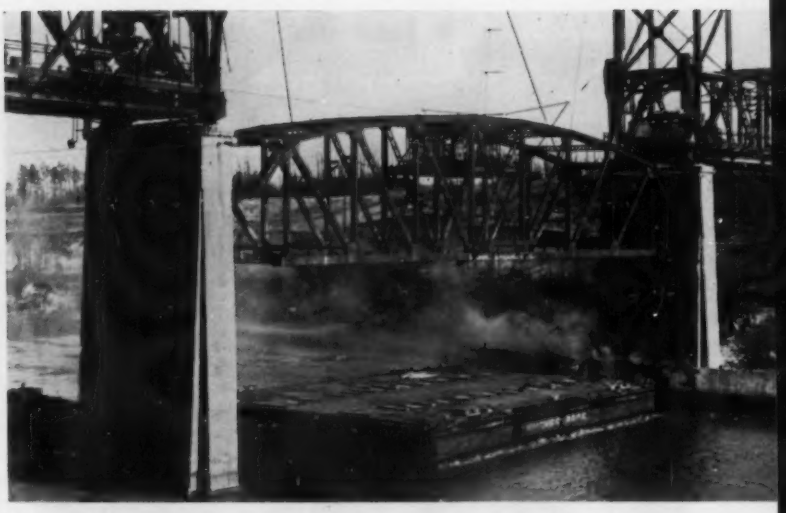
Available in bulk or 100-lb. bags, Morton Safety-T-Salt also is ideal for stabilizing roads. So order enough now for your winter ice and snow control program. Any Morton Safe-T-Salt left over can be used in your summer road stabilization projects.

*Safe-T-Salt is a trademark of the Morton Salt Company

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. RS 9
110 No. Wacker Drive, Chicago 6, Illinois

. . . for more details circle 333 on enclosed return postal card

Charges taped in place; Loizeaux tying them into the Primacord firing circuit.



Free of the supporting towers, the big center span is carefully lowered to barge for towing to Baltimore Harbor. Lowering operation took 40 minutes.

CAREFUL BLASTING

Continued from page 131

that it had little adhesive quality. It refused to stick on vertical members and finally had to be taped in place. A total of 145 lb. of the nitro gelatin was placed in two general areas: the base of the steel tower where it rested on the concrete pier, and at the south end of the truss where it abutted the wooden trestle approach.

The charges were initiated with Primacord. The shot was triggered by two CD-48 blasting machines, the loading at the tower base being fired just ahead of the other loading. Concussion from these two exposed detonations was quite pronounced and there was some fly of steel fragments. But the area had been cleared for about a quarter-mile and at no time was there any danger to the officials, workmen and surprisingly large number of spectators who had gathered to watch the virtually unannounced shot.

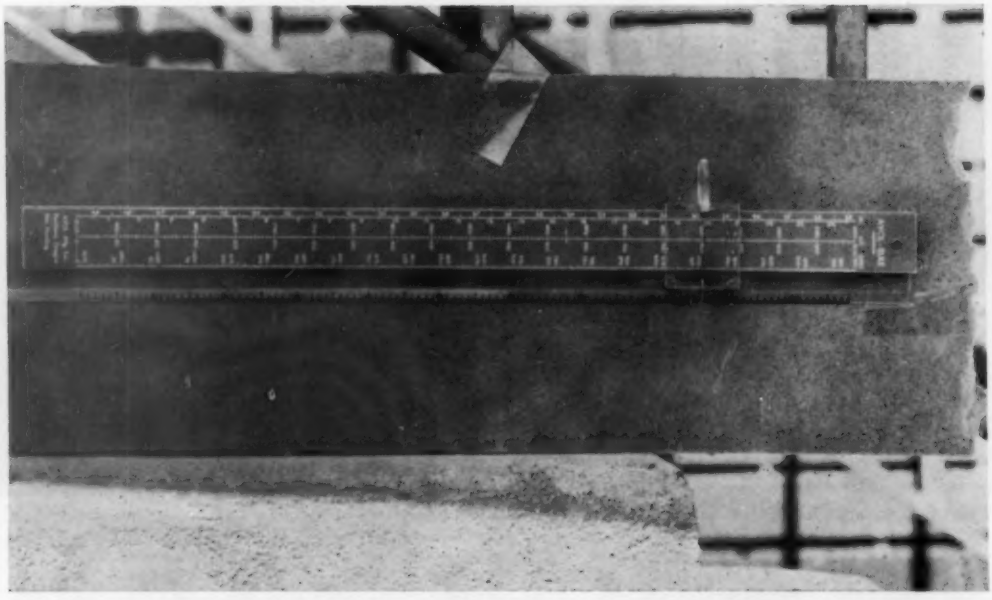
The north tower and span assembly was felled three days later with some modifications in the blasting procedure. The loading was cut to a total of 110 lb. of nitro, and it was all placed to take out the support for the tower's rear vertical members. The charges were placed only on horizontal chords and were easily sandbagged. No explosive was placed at the shore end of the truss, as was done on the previous shot.

Operator is about to set off blast for further demolition of the south counterweight, shown suspended at deck level, using fractional stick charges.

The blast was fired with only one CD-48 machine, and the tower collapsed very rapidly shorewards carrying the truss down cleanly. Concussion was far less than in the first-shot, throw of debris was minimal.

For each tower-truss blast, the canal was closed to traffic for less than an hour. Placement and firing of explosives were accomplished by a handful of men and the structures came down in about 10 seconds each. This loading by just a few personnel and the brevity of the dynamiting operation dramatically reduced accident possibilities. Were the two structures dismantled "by hand," weeks of hazardous work on high iron would have been required.

Prime contractor for dismantling was Lippsett, Inc., New York City. Dynamite subcontractor for demolition of counterweights, towers and end trusses was Controlled Demolition, Inc., Baltimore, Maryland. Dynamite specialist in charge was John D. Loizeaux, president of Controlled Demolition, Inc. Mr. Loizeaux is known nationally for his use of explosives in felling major buildings, industrial stacks and other unusual applications.



Avol Rule simplifies figuring of cross-section areas.

New Cross-Sectioning Method Beats Planimeter

By H. K. Glidden
Contributing Editor

A device known as the Avol Rule has been developed to simplify the time-consuming figuring of cross-section areas. Its inventor is F. LeRoy Davis, an aerial photo engineer with the Utah state road commission. While the Avol Rule is being used by a number of engineering agencies, the Utah experience is considered typical in assessing its properties.

Utah has thirteen of the units in use. In the words of W. S. Peterson, assistant chief design engineer, "the Avol is a good tool. Most everyone prefers it to the planimeter."

The principle of the Avol is simple; it is a mechanical method of adding ordinates on plotted areas. The features which enhance its value are more difficult to describe and consist of scales and conversion tables. Areas plotted to 1 in. equals

Table 1 Consistency Results with Avol Rule

Station	5-Ft. Ord. Spacing			10-Ft. Ord. Spacing		
	Trial 1	Trial 2	Average	Trial 1	Trial 2	Average
508 + 54.8	454	457	457	454	454	454
509 + 00	448	446	446	452	448	450
510 + 00	548	542	545	556	550	553
511 + 00	677	681	679	682	688	686
Total Sq. Ft.			2127			2143

Table 2 Consistency of Planimeter Results

Station	Trial 1	Trial 2	Trial 3	Average
508 + 54.8	455	452	451	454
509 + 00	461	457	460	459
510 + 00	548	553	550	550
511 + 00	668	690	672	673
Total Sq. Ft.				2136

10 ft., may be read directly; most other scales require a conversion factor. When cross sections are plotted on 50-ft. stations, earthwork volume can also be read directly. The acreage of land areas can be read directly to two decimal points.

The Avol Rule besides competing with the planimeter, also is an alternate to the electronic computer and the machine calculator for cross-section computing. The electronic computer offers an edge in speed, but the rule appears to have definite advantages over the other two methods.

G. H. Guerts, part-time highway employee and a Utah University engineering student, performed studies to determine the accuracy, consistency and speed of the Avol as compared to planimetering in connection with a technical report writing assignment. Guerts used plotted sections of known area as a control. He found the accuracy of the Avol to be plus or minus 0.5 percent as compared with 1.25 percent for the planimeter.

Tables 1 and 2 show his results on consistency using four typical highway cross sections taken from Utah files. Consistency of results by the two methods are about the same.

Tables 3 and 4 show his results on speed of operation. It will be noted that when ordinates were added for every 5-ft. spacing, that the Avol required 217 seconds, the planimeter only 134 seconds. But when a 10-ft. spacing was used, the Avol was 27 seconds faster.

From many hours usage of both methods Guerts concludes that the Avol is preferable to the planimeter except for small irregular areas. He finds that he works under less tension with the Avol.

In the Utah road work about 75 percent of all cross section area figuring is now done with the Avol, at about twice the speed of planimeter work. Chief designer Peterson also has found the Avol to excel in calculating areas for clearing and grubbing. He cited an extreme instance where clearing for a 5-mile stretch of highway was calculated in one-half-hour with the Avol, as compared to 8 hours by conventional methods. Peterson had tests run and found the accuracy of the

BONDED
BUY
NOW AT YOUR CATERPILLAR DEALER...
Big Bargains
IN USED EQUIPMENT!
Do you need extra equipment to finish that job before bad weather sets in? See your Caterpillar Dealer! He has the biggest selection of top values in town . . . nearly all makes, all sizes, all models, all conditions . . . priced to sell with financing tailored to meet your needs!
No guessing or gambling on your part. Your Caterpillar Dealer reconditions, classifies and warrants most of his used units. You know what you're getting . . . and you're protected . . . with these three types of buys:
1 A "BONDED BUY" Cat-built machine, the most productive used equipment you can buy. Carefully checked, it is backed by his written bond up to $10,000, assuring you parts and service protection for the warranty period.
2 A "CERTIFIED BUY"—a written warranty covering units of any make in good condition.
3 A "BUY AND TRY" deal—a written money-back agreement on machines not in the above two classifications.
Only a Caterpillar Dealer will provide you with "Bonded Buy" protection. He backs his machines with prompt service and parts you can trust. Look him up in the Yellow Pages . . . look over the machines in his used equipment lot. You'll find the best buys in the market there!
Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.
CATERPILLAR
Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.
BEST USED EQUIPMENT BUYS ANYWHERE
. . . for more details circle 290 on enclosed return postal card

device to be within acceptable limits as compared to results by electronic computation.

Several other opinions are worth noting. Dick White, design engineer, expressed a strong preference for the Avol. Dick Fry, section chief, thinks the two methods are about on a par, depending on the skill of the operator. Al Madocks, another design engineer, finds the Avol to be faster and more consistent. Karl Lambert, electronic computer operator, considers the Avol as an adjunct and useful in figuring balance points, but no substitute or competition for the computer.

The Avol is marketed by the Engineering and Marketing Associates, Inc., priced at about $35 along with instructions and illustrations of problem solutions.

Table 3 Time Study of Avol Computations

Station	5-Ft. Ord. Spacing Trial 1	Trial 2	Average	10-Ft. Ord. Spacing Trial 1	Trial 2	Average
508 + 54.8	52	50	51	25	28	27
509 + 00	48	45	47	25	23	24
510 + 00	54	58	56	26	28	27
511 + 00	62	64	63	28	30	29
Total Seconds			217			107

Table 4 Time Study Using Planimeter

Station	Trial 1	Trial 2	Trial 3	Average
508 + 54.8	45	36	40	40.3
509 + 00	30	29	32	30.3
510 + 00	35	36	32	34.3
511 + 00	30	27	31	29.3
Total Seconds				134.2

EARTHMOVING TIRE TIPS

Continued from page 89

to vehicle obstructions. Spring clips, fender bolts and similar objects may appear to have sufficient clearance when the vehicle is stationary, but under operating conditions the body movement may cause them to contact the tire and cause severe abrasion. Dry, caked mud and rocks also should be kept cleared from tires, especially from between dual mounted wheels.

Grabbing brakes, another cause of tire wear, should be adjusted promptly.

Haul Roads. Haul surfaces and loading areas should be patrolled regularly to remove rocks and smooth out "washboard" surfaces. Good haul routes speed the loading cycle, and help prevent excessive tire wear and damage.

Special care should be taken to provide proper facilities for storing spare tires and tubes. They should be protected from direct sunlight, moisture, grease and oil—all factors which can take a toll of tire life.

Finally, another attack on the tire foe, heat build-up:

To reduce the heat problem, a number of approaches are possible.

Keep tire loads within recommended limits. When loads exceed recommended limits, the use of higher ply ratings is in order. The stronger bodies will permit higher inflations to support the high loads, reducing heat-producing flexing.

Keep speed within manufacturers' specifications.

If using tube-type tires, consider a change to tubeless tires which run cooler because the bulk of tube and flap is eliminated.

It may be feasible to change to a type with less tread thickness—another way of cutting heat.

For extreme conditions, the contractor should investigate the availability of special heat-resistant tires.

Through the proper tires and proper tire maintenance methods, the contractor can save time as well as money. This is an area the successful construction man doesn't overlook.

Rest Area Design for Interstate Highways

In Michigan where the freeway program is far along and many miles opened or nearly ready for traffic, much attention has been given to rest areas along freeways.

A citizens advisory committee on this subject recently came up with suggestions. These have been embodied by the Michigan State highway department in designs for the first 45 such areas planned throughout the state. Three areas will be on I-94, a continuous 132-mile segment to be opened in 1960.

Features of these facilities which will be spotted every 35 to 50 miles, occupying 8 acres each, are as follows:

1. Parking for 50 cars and 20 trucks, plus limited picnic facilities.

2. An internally illuminated case housing a road map and tourist information.

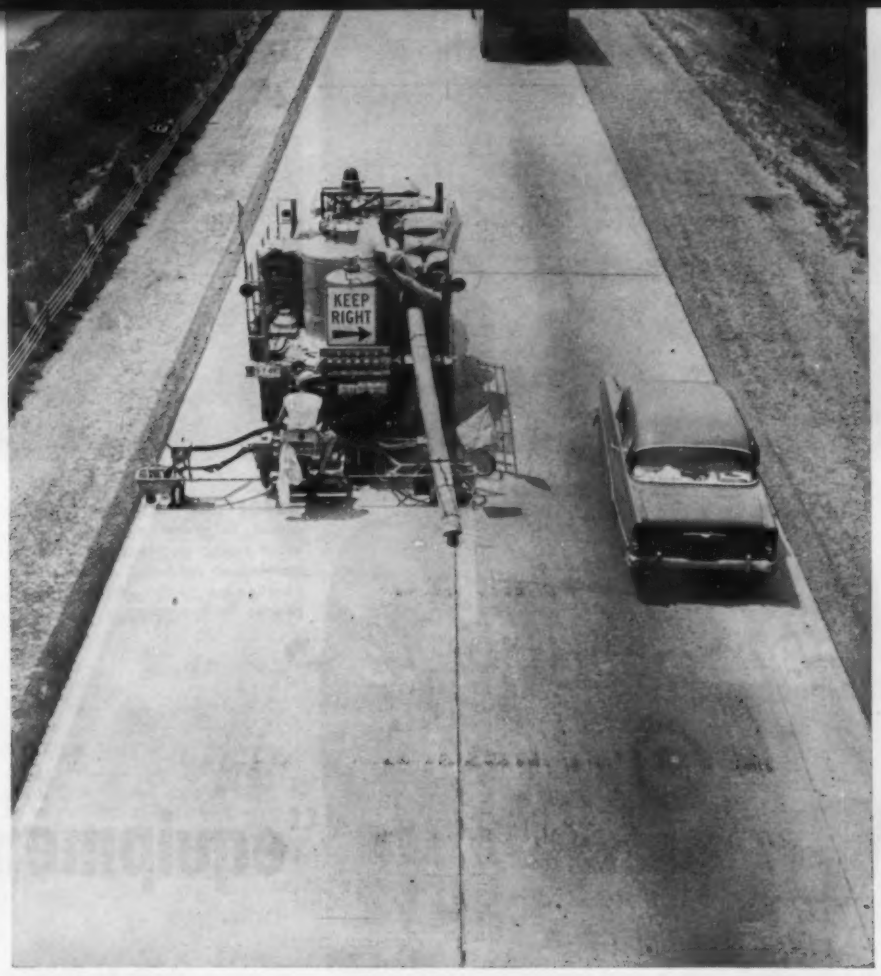
3. Two coil-operated telephone booths with directories for nearby communities, to help motorists find gas, food or lodging facilities off the freeway.

4. Comfort facilities, consisting of unheated minimum provisions (heated facilities too costly for present).

5. For one area, maximum lighting; for others, minimum lighting at phone booths, comfort station and information sign.

6. Maximum type information facilities (similar to the manned highway information centers already operating at certain resort areas), will be errected by the highway department at major points of state entry.

7. And certain emergency services. Soon to be offered to the traveling public these include contact with radio in case of accident or being stranded. (Regular emergency patrols not advised at this stage as costing too much and duplicating the regular highway patrol facilities).



This improved double striper is helping keep the Ohio Turnpike pavement marking in good condition, and has been a safety aid in itself by minimizing the hazard of this operation done of necessity under heavy traffic.

Center and Edge Stripe Painted in Single Run

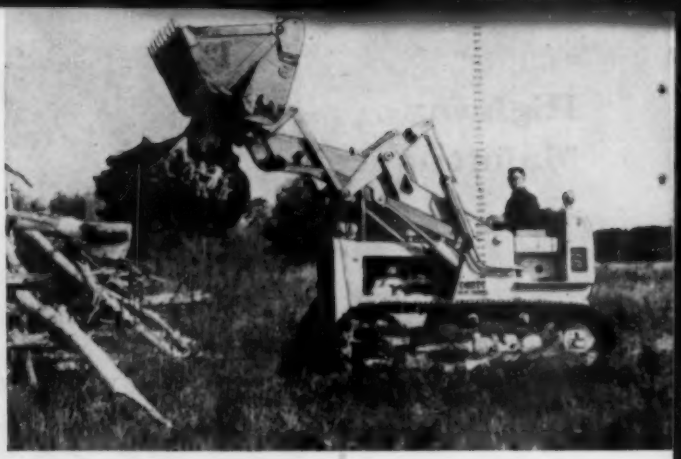
Pavement striping along the Ohio Turnpike today includes a white solid line at both edges of the roadway pavement, and a white broken centerline. Keeping these lines fresh under very heavy traffic over the turnpike's 482 miles of dual express roadway is one of the top-priority maintenance jobs. The equipment pictured represents the latest step forward in streamlining this operation.

The large-capacity machine, as shown, puts down an edge stripe and the centerline stripe simultaneously. Designed for lower costs as well as a reduction of the frequency of interrupting traffic, the unit has so speeded the operation that motorists have the safety advantage of a freshened stripe earlier in the season than before.

According to a turnpike spokesman this type of machine works best when the job primarily deals with uniform-width pavement. Even so, an accurate and evenly delineated centerline cannot be obtained by merely following the slab edge; the edge often is too uneven for visually guiding the machine to the desired accuracy, and it has been found best for the operator to follow the sawed centerline joint or previously painted centerline.

There are other tricks in this machine's use. For example, when edge lines and a centerline are being applied to a 24-ft. pavement, the turnpike officials report that the best arrangement is to apply the inside edge and the centerline at the same time. One-way traffic can be more readily diverted to the right-hand lane. Furthermore the continuous left-hand edge line is not disrupted by acceleration and deceleration lanes which normally connect with the pavement on the right-hand side. In other words, the left-hand edge is a continuous line which is uninterrupted.

It is necessary to revise the controls of the vehicle so that the driver may operate from either the left-hand or right-hand side. In this case the driver moves to the right-hand controls so as to apply straight lines by visually lining up his front-end guide marker with the center sawed joint.



GRADE Use "carry-type scraper" action to grade with inch-close, labor-saving accuracy. Watch the earth boil into this 1½-cu. yd. Four-in-One as the operator does precise finish-grading.

GRAB Only the clam-action 4-in-1 lets you sit, grab, lift, and load "impossibles" like stumps, concrete, and rubble of all kinds. This action helps make the 4-in-1 a big money-maker for land and site clearing—cuts your equipment investment.

...only clam-action 4-in-1's upgrade your income with... "equipment spread"

Put the whole "equipment spread" of International Drott 4-in-1 actions to work. Prove in minutes that each 4-in-1 action doubles for one or more specialized machines; that each action gives you a great range of job-handling working positions; that you're really getting a "Forty-in-One"! Compare 4-in-1's exclusive shock-swallowing Hydro-Spring performance protection. See what it means to upgrade your income with a 4-in-1, far above what an old-style single-action loader, or any other limited-duty rig can earn you. Let your International Drott Distributor demonstrate!

INTERNATIONAL® DROTT®

International Harvester Co., Chicago 1, Illinois

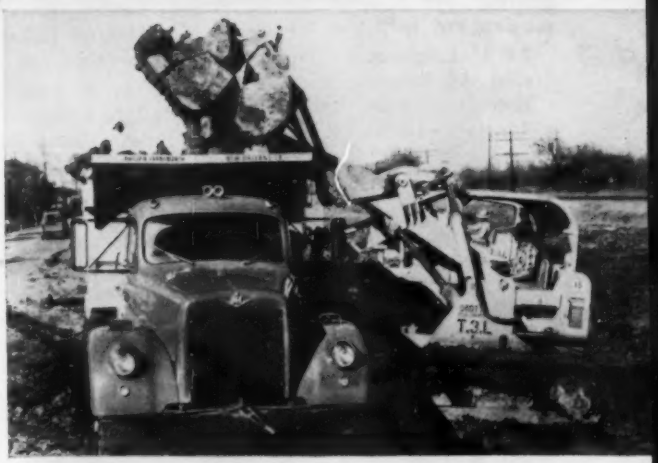
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

BACK-DRAG Pull down materials wholesale (and safely) from the sand or gravel bank. And grade hard-to-get-at slopes with easily-controlled 4-in-1 back-drag action—which you get by simply moving a lever!

SCARIFY Use the scarifier attachment to loosen stony or compacted soils for easy loading or blading. The third valve of the *standard* International Drott hydraulic system provides the control power for the scarifier.

STRIP Set the 4-in-1's clam in "carry-type scraper" position—strip sod or topsoil with efficiency to match specialized, single-purpose stripping equipment. And get jobs other rigs can't do.

SPREAD On-the-go, put down a layer of topsoil, fill dirt, or "cover" with exclusive 4-in-1 "carry-type scraper" accuracy. Regulate thickness of layer you spread, with fingertip ease!



utility!

BOTTOM-DUMP End the sticky materials problems, for good! Opening the clam of this 2¼-cu. yd. TD-15 Four-in-One pulls material from bucket surfaces—gravity down-pull does the rest—to assure positive, self-cleanout bottom-dumping.

PICK-UP Employ easily-controlled clam action to fill the 4-in-1 with elusive loose materials, in one fast gulp—and without "chasing" them. Watch this 1⅛ cu. yd. TD-6 Four-in-One! You eliminate need for hand-shovel clean-up labor!

DO SHOVEL WORK Apply famous 4-in-1 pry-over-shoe break-out power and get power-shovel-like excavating force. This 3-cu. yd. TD-20 digs up concrete slab, tons at a time with up to 43,150 lbs. of break-out force—replaces a boom-type rig here!

BULLDOZE Open the 4-in-1's clam and you've got a full-capacity, earth-rolling dozer—depth-regulated by positive radius control. This action can "double" for a specialized dozer 'most anywhere! And it's instantly available at a touch of the "job-selector" lever!

COST ACCOUNTING

Continued from page 75

different auditors who handle more construction business. It would seem that they could give us more professional help.

I hate to ask you for a favor after taking up so much of your time, but possibly you might have suggestions or list of publications to assist me. This is difficult I know, since you haven't seen our system and do not know my background. But I would greatly appreciate any help you can offer.

J.R.U. Learning,
Cost Accountant,
Bidright Construction Co.
Sunrise, Arizona

Mr. John R. U. Learning
Construction Cost Accountant
Bidright Construction Co.
Sunrise, Arizona

Thank you Mr. Learning for your recent letter. Your situation and problems are certainly typical of the ones that are facing a great many of this newest "crop" of contractors. Your letter was also repsentative of several of the inquiries that have been received as a result of the Constructive Cost Control Series being developed through the encouragement and sponsorship of Harold J. McKeever, Editor-in-Chief of Roads and Streets.

Therefore, with your permission, I am making this public answer to your letter. This is in the sincere hope that several other readers of Roads and Streets will see that in a great many instances they have absolutely no corner on what they themselves may consider unique problems—or more than their share of troubles and streaks of hard luck. To begin, I believe you'll agree with me that: the object of cost accounting for any business—whether it be operating a dairy or running a spread of dozers and pavers—is basically the same. In each case the cost accountant tries his level best to present his employer with a reasonably current, understandable and accurate picture of his sources of income and expense. Whether the product be butter or concrete, cheese or black top, an awareness of the processes involved in their manufacture does help.

However, there is nothing to keep a man with your background and determination (plus your willingness to work and learn) from becoming a very good cost accountant in the construction field. In fact, even in road building work it is quite possible to become overly familiar with the various kinds and phases of the work—so much so that one can actually overlook or consistently take some cost elements for granted. Thus, what might be obvious costs to someone with your training, could conceivably be the "hidden costs" that have been plaguing older hands for a long long time.

As a possible learning device might I suggest the following technique that is often used by Estimators? When trying to predict costs on a new and different type of work, it is possible to get a fairly approximate answer by breaking the job down into a series of elements or operations. After you are certain that this has been properly done, then all that remains is to total up the labor, material and equipment requirements for each phase, make allowances for supervision and overhead, and your are ready to tack on some profit.

In a case such as yours, this sort of a study could not only be of value as a learning aid, but also might help to give you a better perspective or overall picture of the type of jobs your employer handles.

Without knowing any of the specific details of your particular accounting system, and how it is set up, I can only offer this truism regarding any cost system. The value of any accounting arrangements or system depends to a large extent upon how easily it can be mastered by the people who are supposed to use it. Better systems always seem to have a considerable amount of "built-in" reasoning. By this, I mean to say that the combination of a good system in the hands of a good accountant will result in the effective translation of figures into understandable facts.

Lastly, I don't know of any successful system which was not flexible enough to undergo some changes and modifications in order to accommodate the changes in the structure of the company using it.

Contractor Cooperation. You mentioned the problem of getting other construction men to realize the common-ness of their cost control problems. This is not unusual. In fact it is one of the reasons why such progressive contractor groups as the AGC are steadily growing. This association's leaders realize the need to promote cooperation among contractors—with the purpose of getting together to come up with good answers to a lot of their mutual problems. (By the way, does your firm belong to a chapter of a contractor association such as the Associated General Contractors of the American Road Builders' Association?) If so—try to get the association emblem on your firm's stationery—it will do more than just identify your company!)

The reticence of some contractors to discuss their mutual accounting problems always comes as a surprise. I hate to say this, but sometimes the ones who are the most secretive seem to be that way in order to keep from admitting that they count with their toes while curled up under a roll top desk. Which is certainly a sad way to fight for survival today! But, on the other hand, this situation is an old story!

Very frankly, with your years of preparation and previous experience in cost accounting, you may have more to offer some of the contractors whom you have talked to than they could possibly give you. In fact, I'd be inclined to tell them so, and to also again point out that actually these contractors have nothing to lose—and a great deal to gain. Furthermore, as your experience in the roadbuilding industry grows, so should your contracts increase among the mutual acquaintances of other contractors such as equipment and material salesmen. You will also find that some of these people are ex-contractors themselves who can at times offer some friendly advice. It is even quite likely that these same salesmen will be willing to introduce you to other construction men who also have progressive ideas like yours.

Another way of obtaining mutual cooperation that has worked out well on the West Coast has been through the annual Construction Conferences. These have been held alternately at the Westwood or

Berkeley campuses of the University of California. I have participated in these conferences and would be glad to do what I can to help get similar meetings something like these started in your area.

Sources of Construction Cost Information. The sources of information mentioned in your letter are well known and widely used. You will get some good general ideas from the ASCE book on Construction Cost Control. I've never regretted what I paid for my copy. I would like to suggest that you contact Mr. George Deatherage of Satsuma, Florida, regarding his "Manual" and aslo his "Superintendent's and Project Manager's Training Course." These are *used* by a large number of construction companies. I am also surprised that you have not heard of Mr. W. Earle Roche's "Construction Report No. 432. However, there was only a limited edition of this book written and published by him. I understand that he has presented some of the remaining copies to the libraries of accredited universities in order to promote the profession of Estimating. If you can't obtain a copy from him (128 Western Ave., Glendale 1, Calif.) you might ask your school librarian if your school has a copy, or would try to get a copy to lend you. It is a source book on estimating methods that has no equal in the fields which it covers.

A few Notes on Auditors. An auditor's main concern is that the opposing entries are correctly balanced and, as far as he is able to ascertain, that the entries agree with physical conditions. Sometimes it takes a while before auditors begin to develop a feel for the special problems related to construction cost accounting. This is especially the case, if they have had a limited experience in construction work. On the other hand, it is also the responsibility of the auditor's clients to give the auditor as much help as possible. Because there are not too many CPA's and Auditors with construction experience, it has often been found that it is possible for many auditors to do as good a job for their contractor accounts as they do for their other clients. In any case, I strongly rec-

BIG

in QUALITY and ECONOMY

OWEN

OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets —and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.

The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

. . . for more details circle 336 on enclosed return postal card

ommend periodic audits.

In this same field of auditing, as you have already discovered, the construction industry is one of the few "producing" types of enterprises for which more detailed studies of accounting schedules remain to be published. Time permitting, I shall try to discuss this particular subject in greater detail in some future issue of Roads and Streets.

In closing, may I again thank you for writing me. I hope that this somewhat lengthy reply will help you and other readers of Roads and Streets. If I can be of further assistance, please do not hesitate to write. Meanwhile, may you have good luck and continued success in your profession.

James P. apRoberts
Construction Cost Control Specialist
La Canada, California

Maintaining Your Equipment

Tracks Rebarred at Less Cost

Saving of over one-third in manhours required to replace a set of worn grouser bars has been realized from the installation of a mechanized "squirt" welding unit at the plant of Carolina Tractor and Equipment Company, Salisbury, North Carolina. The company is a Caterpillar dealer and equipment rebuilder.

Grouser bars were formerly installed by manual welding with low-hydrogen electrode. Formerly, a single pass across one side of a new 18-in. bar required three minutes and 10 seconds arc time. Now, as shown, with mechanized equipment, a pass can be made in 49 seconds arc time.

The welding gun used is self-propelled, with built-in motor drive. Flux is deposited continuously from a container on the gun which moves along the joint at travel speed of about 22 in. per minute.

The welding unit is compact and portable, with power supply and electrode wire feed in an integral unit. It can be adapted to many other routine welding jobs where high speed and minimum operator skill are combined.

Welding arc time is reduced to a fraction in this North Carolina overhauling shop.

How Big a Staff for Equipment Maintenance

Faced with the ever-present problem of equipment maintenance, how does the plant, service, or office manager decide whether to: leave the equipment alone; have one man service it; or have a series of men service it?

An Air Force report which provides the manager guidelines for analysis of the problem has been released to the public through the Office of Technical Services, U. S. Department of Commerce.

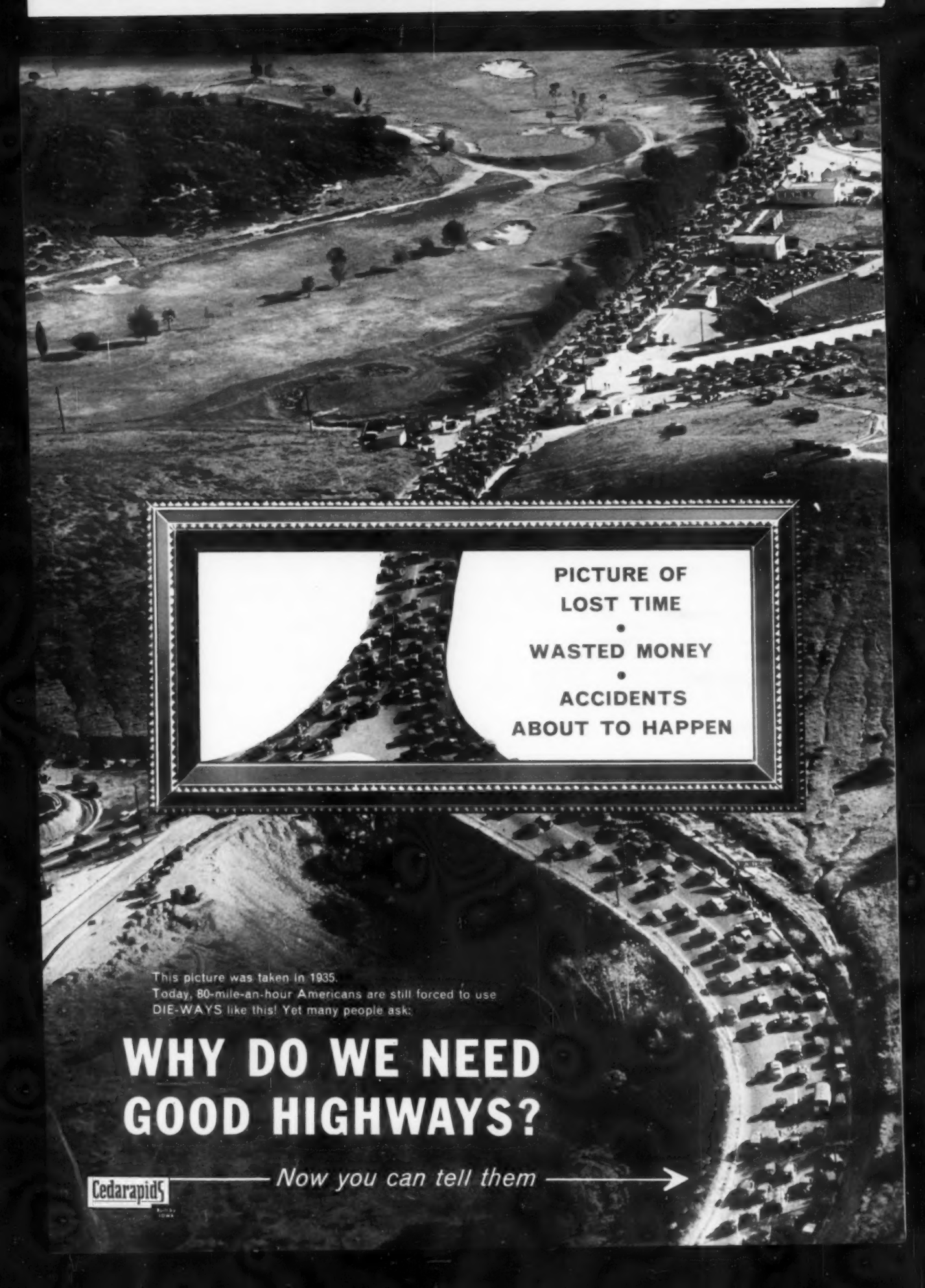
The simplified analysis is based on studies of the consequences of ways of assigning maintenance men. Foundation of the analysis is probability theory. Equipment and repairs are considered to be Markov processes.

Decision to use no men, one man, or more than one in sequence is shown to depend on what are called the Initial Condition Parameter (probability that the equipment will operate), the Repairing Skill Parameter, and the Skill Difference Parameter (the differences within an individual man, or what the authors call the "foul-up-fix-up" factor.)

The simplest case considers only one type of equipment and one type of maintenance man—one "homogeneous in skill level." The analysis is also extended to more complicated cases involving a pool of maintenance men with "heterogeneous skill levels."

An important finding was that the Initial Condition Parameter becomes less and less influential as the number of men in the series is increased. Put another way, this means that the functioning of the equipment ultimately depends on the skills of the service men.

The analysis technique is described in PB 151683 *Equipment Maintenance with Various Numbers of Service Men: A Simple Analysis*, G. O. Wright and others, Wright Development Center, U. S. Air Force. The report may be ordered from OTS, U. S. Department of Commerce, Washington 25. It contains 41 pages, price $1.25.



This picture was taken in 1935.
Today, 80-mile-an-hour Americans are still forced to use DIE-WAYS like this! Yet many people ask:

WHY DO WE NEED GOOD HIGHWAYS?

Now you can tell them →

Cedarapids

43 REASONS

WHY AMERICA NEEDS BETTER HIGHWAYS NOW!

Strangulation of our national economy by a gigantic nationwide traffic jam, and the crippling of our defense effort through failure to keep the Federal Highway Program going, would be more costly than any of us can afford.

But most American citizens *don't know why* we need good roads. They are apathetic. Because they do not understand, there is little public support for a well-planned, nationwide system of interstate, state and rural roads.

It is up to us to give the public the facts . . . show our friends, neighbors, and associates the benefits the Highway Program will bring to each individual . . . how it affects his pocketbook, even his life. Only when every citizen knows the facts can public opinion influence *intelligently* the men who make the laws to keep the Highway Program rolling.

Here are 43 of the hundreds of reasons why we must have better highways now. Add your own reasons and use them all to help obtain the enthusiastic local support we need.

GOOD ROADS SAVE MONEY

1. Total annual avoidable waste over *all* roads in the U.S. amounts to $3 billion. Interstate Highways would save $550,000,000 in gas consumption, brake and tire wear, vehicle operation—save $725,000,000 now wasted on traffic accidents—save $825,000,000 in time lost by commercial vehicles.

2. Modern Interstate Highway engineering eliminates steep grades, sharp curves, intersections at grade, stop and go driving. Good highways can bring about annual savings of $750,000,000 in direct operating costs of trucks and buses.

3. Payments of insurance covering property damage and personal injuries resulting from highway accidents equal 12½¢ per gallon of gas consumed, That equals $116 for every motor vehicle registered.

4. It costs less right now to build a typical mile of Federal Aid Highway than it did during the first three months that the 1956 Highway Act was in effect.

GOOD ROADS SAVE LIVES

5. In 1920, the traffic death rate per 100 million miles was 28.2. In 1940, the death rate was 11.4. Then we started building better, safer roads. Bertram D. Tallamy, federal highway administrator, predicts that the death rate will decline from the 5.6 per 100 million miles in 1958 to 5.0 in 1970 and to 4.4 in 1975.

6. The controlled access highway is at least 2½ times safer than the ordinary highway. On Virginia's Shirley Highway, with controlled access, the fatality rate is 0.8 deaths per 100 million miles. On the parallel U.S. 1, with no control of access, the death rate is 10.6.

7. Traffic accidents today are killing 38,000 people annually. Experts estimate that highways *engineered for safety* would save 4000 lives per year. By 1970, continued use of The Interstate System could save 37,800 people.

8. If traffic volume increases by 50% in the next ten years, there will be 55,000 fatalities a year—unless safer roads cut the rate.

9. In Chicago, the chance of having an auto accident on congested streets is 30 to 50 times greater than on the new Congress Street Expressway.

10. In 1959, accidents cost $4.3 billion. Modern highways *can* eliminate a very large part of the monetary waste of accidents.

GOOD ROADS FOSTER ECONOMIC GROWTH

11. Modern highways are a sound, durable investment in the growth of the Nation.

12. The dollar value of goods and services for a specific period is called the Gross National Product. $1 billion of highway construction contributes to the Gross National Product as follows: Steel, 510,000 tons; bituminous materials, 995,000 tons; cement 16,000,000 barrels; explosives, 18,345,000 lbs.; aggregates, 76,415,000 tons; petroleum products, 122,794,000 gallons; construction equipment, 34,584 pieces; trucks and cars, 22,500 pieces. These are based on each $1 billion in excess of an annual rate of $5.8 billion of construction.

13. The New York Thru-Way is officially credited with stimulating 650 million dollars worth of industrial, commercial and residential development, including $50 million around Tarrytown alone.

14. With the New Jersey Garden

State Parkway, the gain in taxables and retail business in the counties it serves is *twice* that of New Jersey's remaining 11 counties.

15. On Route 128 near Boston, some 227 companies have built 17 industrial parks and 175 million dollars worth of buildings to house upwards of 28,000 people—workers with good wages to spend.

GOOD ROADS ARE ESSENTIAL FOR NATIONAL DEFENSE

16. In case of war, *all* sections of the country must be swiftly available for the defense effort.

17. Highways are relatively invulnerable to atomic attack. It would take 20,000 Hiroshima-type bombs to destroy the 40,000 miles of the projected Insterstate System.

18. We need good highways to evacuate people from our cities; bring in food; bring in medical supplies and help; move large volumes of military vehicles and weapons.

19. Highways are extensions of production lines; defense production depends on them. During World War II, 8 out of every 10 parts needed to make a tank in Cleveland came by truck from 23 states. 75% of the workers in 749 defense plants drove to work in their automobiles. 60% of all out-bound tonnages from defense plants was road-borne.

20. A network of good highways will assure nation-wide mobility for all our defense resources.

GOOD ROADS BENEFIT LABOR

21. The American working man drives his own car to his job. He can offer his services throughout a greater area; he has a greater diversification of jobs to choose from.

22. With good highways, the laboring man can think in terms of minutes rather than miles of driving to and from his job.

GOOD ROADS BENEFIT FARMERS

23. American farmers operate over 6,406,000 motor vehicles (including 3 million trucks). 89% of all farm products now reach their markets by highways.

24. Better rural roads bring markets and sources of farm supplies closer together, make schools more accessible to farm homes, make medical services readily accessible.

GOOD ROADS INCREASE BUSINESS

25. One out of every six businesses (mostly small, independent firms) serve the Transportation Industry. Good roads are a shot in the arm to the small businessman.

26. Of the people who do the buying, 60% own automobiles. American consumers spend $38 billion per year to own and operate their cars, helping to support garages, service stations, manufacturers of automotive parts and accessories, etc.

27. 60% of American buyers purchase goods that are transported via highways, streets and alleys. Fast deliveries increase business.

28. 70 million Americans take vacations by car each year (over 75% of tourist travel is by car), averaging 1013 miles per round trip. Many others travel by bus. Altogether they spend $9.2 billion on vacations. This is big business for motels, resorts, restaurants, and souvenir shops, to name a few!

29. The annual bill for recreation travel is $14 billion. 22% of this is automobile expense. Big business for the automotive industry!

GOOD ROADS FURTHER FULL EMPLOYMENT

30. One out of every seven American jobs is in the field of Highway Transportation.

31. Truckers provide over 5,750,000 jobs. Highway Transportation Industries provide 9.7 million jobs. Employed is a labor force equal to the population of all New England states, Arizona, Colorado, Idaho, Montana, New Mexico, Wyoming.

32. Each $1 billion spent on highway construction equals 102 million man-hours of employment on the site of construction and 126 million man-hours off the site—a total of 228 million man-hours of labor.

33. In 1958, an extra $400 million in highway contracts, let as an anti-recession measure, provided 137 million man-hours of employment and broke the back of the recession.

GOOD ROADS BENEFIT ALL INDUSTRY

34. For the Trucking and Motor Carrier Industry alone, Interstate type highways provide these advantages: —Reduction in number of power units required; use of lighter tractors; increased tire life; reduction in fuel and maintenance costs; reduction of accidents and insurance premiums; year-'round maintenance of on-time schedules for livestock and perishable goods.

35. The Private Consulting Engineer profession carries 40% of the engineering load of the new Interstate System.

36. Utilities are free from the burden of acquiring easements of private land because so many consumers are located on good highways. In Oregon, a utility study shows savings of about $100 a mile on 3212 miles of public right-of-way, mostly passed on to consumers.

37. Practically every industry is stimulated by increasing motor vehicle registrations. In 1959, registrations totaled 70,416,000 (3.1% more than in 1958). *In 1971*, it is estimated that 101,200,000 motor vehicles will travel over a trillion miles annually (20.7% on the Interstate System). *In 1976*—114 million motor vehicles will travel 1.2 trillion miles a year.

38. By 1976, 230 million people will need industrial goods and services fostered by increased travel on highways, rural roads and city streets.

GOOD ROADS BENEFIT EVERY CITIZEN

39. 8 million children ride buses to school every day of the school year. They need *safe* all-weather roads.

40. Movement of goods and people is faster on modern highways.

41. Time saved means lower transportation costs and lower prices for truck-borne merchandise.

42. Annoying, dangerous traffic congestion is reduced.

43. Modern highways, engineered to last by the application of results of the AASHO test road research at Ottawa, are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future.

Cedarapids Built by IOWA

There is *one* big reason why YOU should get behind this program for enlightening the public on the benefits of a continuing Federal Highway Program. Highway construction is vital to your way of life and the growth of your community. Here you have the ammunition to inform and mold public opinion into supporting, and demanding, vital highway legislation. *Use it!*

BUILD BETTER HIGHWAYS NOW! *Save Lives—Save Time—Save Money*

Sponsored as a public service by **IOWA MANUFACTURING COMPANY** *Cedar Rapids, Iowa, U.S.A.*

A GLIMPSE OF THE FUTURE
demanded by Mr. and Mrs. America

Through-city expressways provide fast transport of goods and services; save time, money and lives of city workers; foster economic growth.

Well-planned interchanges like this relieve traffic congestion to assure safe, easy access to transcontinental highways from urban areas, speeding produce from factory to consumer.

Straight, safe, controlled access Interstate Routes should cover the Nation for greater mobility in Peace or War. Goods and people, weapons and troops must move swiftly to every section of the country to strengthen our economy and defense efforts.

America today is a nation on wheels. Broad, safe highways open new recreational areas and expand tourist trade. Good, all-weather roads across mountainous terrain speed transcontinental commercial travel.

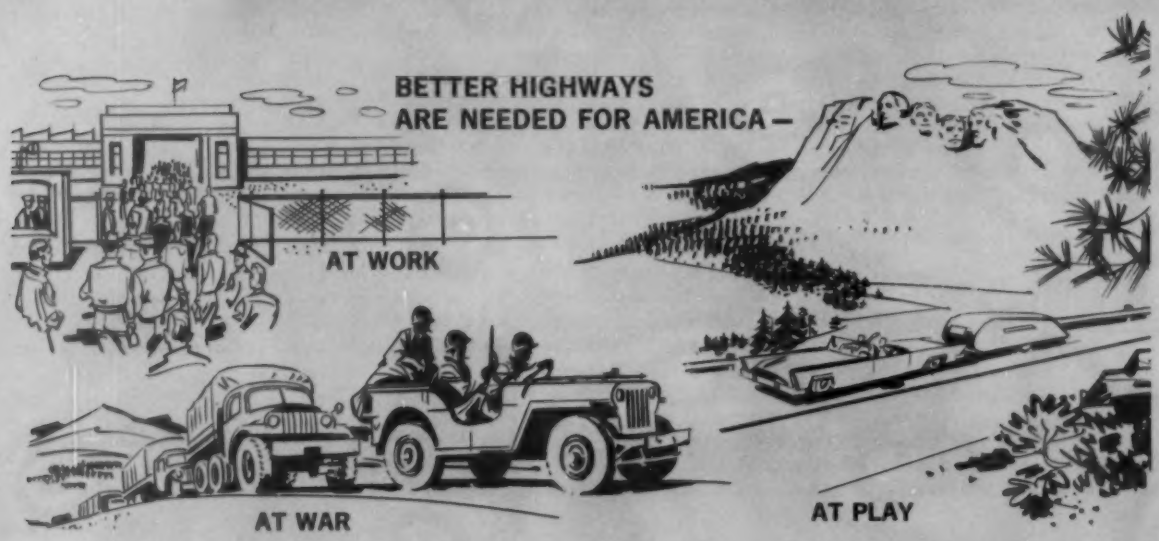
Cedarapids
Built by IOWA

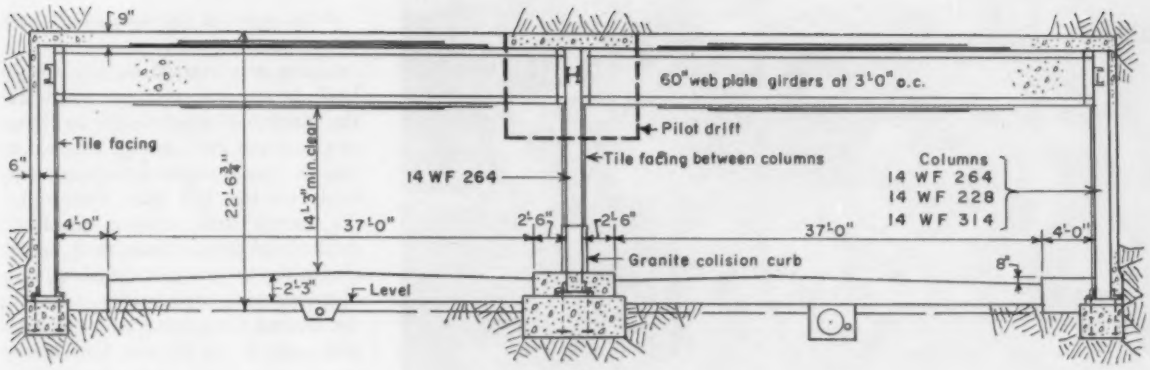
BETTER ROADS MEAN BETTER LIVING

INS 18

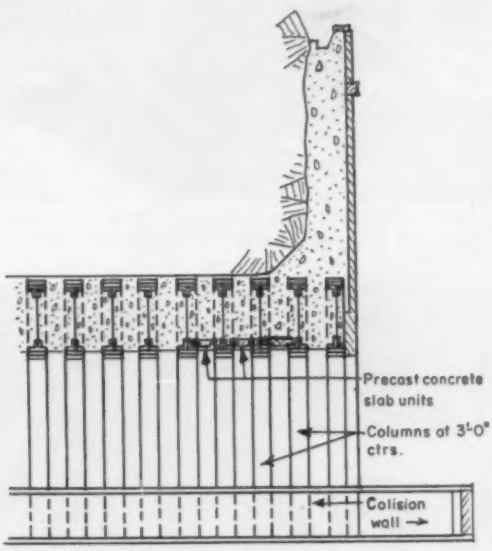
Sponsored as a public service by YOUR CEDARAPIDS DEALER
In cooperation with Iowa Manufacturing Company, Cedar Rapids, Iowa

PRINTED IN U.S.A.





Tunnel cross-section showing the heavy steel girders used in lieu of arch construction to conserve headroom. A subway transit station plaza lies only a few feet overhead.



Showing the close girder spacing for the tunnel roof—spacing and depth uniform, but with three different strength designs depending on location.

SHORT TUNNEL

Continued from page 74

positively determined whether the blasting might cause internal concrete cracking or destruction of bond between the steel girders and the concrete, which could weaken the structure and cause leakage of ground water through the lining. By using a retarding admixture in the concrete it was possible to arrange for the concrete adjacent to the heading to be fully plastic at the time of the blast. However, a second blast would follow one full cycle or 48 hours later, and it was impossible to accelerate the concrete to gain sufficient strength to resist the effect of the second blast, while at the same time keeping it plastic at the time of the first blast.

For the above reason the idea of placing concrete directly behind the the heading operation was abandoned, and the roof load was temporarily transferred to the steel bents by means of precast concrete and wood blocking and wedging which was left in place in the finished structure. As an additional safety measure steel braces were welded between the roof girders to take care of any lateral bending stresses which might develop during placing of concrete. These braces also tied the bents together so that no lateral movement would occur in the event of a failure of the rock roof.

The actual construction of the north half of the tunnel was performed in 48 hour cycles (two shifts per day) from both headings. Each cycle which advanced the heading by 6 ft., included drilling, blasting, mucking, concreting of footings, erecting of steel bents and blocking of tunnel roof. The operations in both headings were staggered to insure continuous work for all operations. The maximum rate of progress was 6 ft. of tunnel per 2-shift day.

As a safety measure, after the tunnel had been excavated about 40 ft. from each portal, the excavation operation was stopped and the tunnel poured. This secured the portal against possible slides. The remaining concrete lining was placed after the tunnel had been holed through and all steel bents erected. Except for a short period at the beginning of the work, the concrete was placed by means of an 8-in. Rex concrete pump located outside the tunnel.

Another view of the west portal. The very hard rock here made a difficult scalping job. Truck below seen with frame used for tunnel cleanup work.

Tunnel holed through, columns and roof girders in place, precast concrete units awaiting placement between girder flanges to serve as a form for pumped roof concrete.

Early tunneling stage at west portal. Pilot drift in upper center had been made before continuing with full-size excavation and setting of steel columns and girders.

After most of the north half had been concrete, excavation and steel erection was started in the south half. In general, the operations in the south half were similar to those in the north half, except that excavation was progressed simultaneously on the full face, instead of the bench and heading method. Additional precautions were taken due to the presence of the abutment of an existing arch bridge carrying the Grand Concourse and the subway over 174th Street. This abutment with its high horizontal thrust was located slightly above the tunnel roof and, at its closest point was within 25 ft. of the tunnel sidewall.

This condition required a suspension of excavating after the east heading had been advanced some 30 ft. beyond the abutment end. About 20 ft. of concrete encasement for the steel bents was placed and cured to support the end of the arch abutment before excavation operations resumed.

Another interruption of the regular progress was caused by poor rock conditions at the west portal, where operations had to be suspended until the portal area could be trimmed and secured.

The last concrete in the lining of the tunnel was placed on June 14, 1960. The work, while difficult has been successfully completed and no settlement of, or other damage to the subway structure or of the arch bridge has been observed.

The remaining tunnel operations include pressure grouting of voids between rock and concrete through holes drilled in the roof concrete, construction of portals and interior finishing, drainage, electrical and paving work.

The project includes other noteworthy features. Brick and stone-faced reinforced concrete retaining walls up to 46 ft. high will flank the expressway. The project has required underpinning of several large apartment buildings, utility relocation, construction of a storm water pumping station, and paving of the expressway, access ramps and service roads. Vehicular and pedestrian traffic has sad to be maintained around and through the site of the work. Demolition of existing buildings was completed under a separate contract prior to starting work under the present

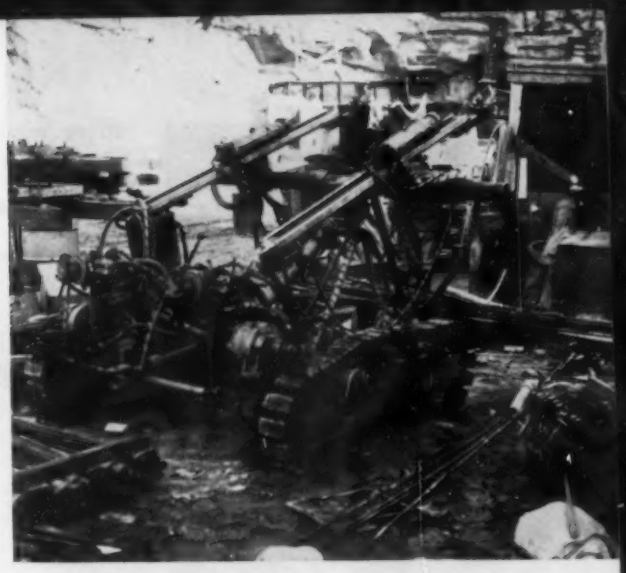
construction contract.

The Cross Bronx Expressway is being constructed by the New York State Department of Public Works under District Engineer Austin M. Sarr, and is part of the arterial program for New York City as developed by Mr. Robert Moses, Chairman of the Triborough Bridge & Tunnel Authority. Design was by Andrews & Clark—Hardesty & Hanover, Consulting Engineers. Construction is being supervised by Shumavon & Buckley, Consulting Engineers with James J. Carroll as resident engineer and Patrick G. Di Fiore as tunnel engineer. G. M. Gaussa, vice president and project manager, Stanley Aronin, general superintendent, and Axel Swanson, tunnel superintendent, have charge of the work for Johnson, Drake & Piper, Inc.

Following the holing through of the pilot drift, the north half of the tunnel was drilled by the heading and bench method at two levels. The upper level was about 16 ft. above the bottom of the tunnel and the heading was carried about 8 ft. ahead of the lower bench. Four Gardner-Denver jackleg drills, Model S 38 F, were used with 1¾ in. carbide insert bits. For blasting in the tunnel DuPont 40 percent special gelatine was used. The whole round was shot in a single blast for the pilot drift. Two shots were generally used in the upper heading, while the bench could be removed in a single shot. Millisecond delays were used to minimize vibration and intensity of noise, the new DuPont "Aqueduct series" delay caps being employed.

Material was mucked by an Eimco and a Traxcavator at the respective headings and hauled out by trucks. The typical procedure at night was to shoot and muck out one heading while the other heading was being drilled. Then the day shift erected steel in one heading, and in the other finished mucking and poured column foundation concrete. Muck in general was stockpiled at night and hauled out in the daytime under this progression.

To permit an early erection of the steel bents, footings were poured with high-early-strength concrete, which was steam cured for fastest hardening using tarpaulins and a truck-mounted boiler.



Two Gardner-Denver Air-Trac drills mounted together on a modified carriage, used in drilling for the depressed approach roadway.

Explosives brought onto this urban job were kept in sheet metal lined storages surrounded by sandbags.

Compressor station on a street level ledge next to the west portal—consists of two Ingersoll-Rand 600 Gyro-Flo units. Six-inch air lines led to each heading.

James Fanta of the North Dakota highway department accepting the keys to the new mobile testing laboratory.

Mobile Testing Lab for North Dakota

Highway construction and road maintenance in North Dakota will get some expediting from a new laboratory on wheels. The North Dakota state highway department recently started using this rolling lab, first of its kind in the state.

The outfit's purpose is to make speedy on-site tests of materials, so that road construction may proceed without costly waiting periods for test results from distant laboratories. The laboratory will also be used to survey and test materials, such as sand and gravels and fill materials used in future construction of roads.

The truck-mounted unit with its special van body was designed by Soiltest, Inc., representing a cost of about $15,000. Specific uses will include testing of bituminous materials, soils and concrete as well as aggregates to assure compliance with specifications.

Testing equipment on board: stainless steel laboratory oven, a hydrameter jar bath with temperature controls, to analyze soil grain size characteristics of soils; dynamic sieve shaker and sieves for gradation studies; and a stability compression testing machine and its related equipment for testing the strength and stability of bituminous mixes.

Also there is an 80-gal. water storage tank, compressor, 5 KW remote-control electric generator and air conditioning.

NBCA Chooses Texas College for Research

The National Bituminous Concrete Association has accepted the invitation of Texas A & M College, College Station, Texas, as the location of research offices for the group's new $1.3 million Quality Improvement Program. Bryant M. Collins, of Austin, Tex., association president, said that the research office will be moved from its temporary location in Vicksburg, Miss.

The decision to locate at Texas A & M was reached during NBCA's midyear meeting at Kiamesha Lake, N. Y. Thirteen universities and research agencies had made invitations or indicated an interest in the national research program. After months of careful study, including personal inspections of each site by NBCA's Research Coordinator, Charles R. Foster, the Association's 12-member Quality Improvement Committee recommended, by a majority vote, the Texas A & M site. The Committee's recommendation was approved by the NBCA Board of Directors without prejudice to the other locations.

NBCA, composed primarily of bituminous concrete paving contractors in the U.S. and abroad, had officially launched the research program last February at its fifth annual convention in Detroit. (Roads and Streets, March, 1960.) The program is intended to embrace every phase of high-type bituminous concrete construction that might even remotely influence the quality of the finished pavement.

Research is already under way on parts of the program. In addition, a literature survey is being made of all Highway Research Board publications dealing with bituminous concrete. Also, a translation of U.S. Corps of Engineers' research on heavy-duty airfield pavements is being prepared for guidance to public officials in preparing their own designs for interstate and defense highway pavements.

McCONNAUGHAY LICENSEES
Operating K. E. McConnaughay Emulsified Asphalt Plants

ALABAMA
Vulcan Asphalt Refining Co., *Cordova*

FLORIDA
E. A. Mariani—Emulsified Asphalt
Hooker's Point, Tampa

ILLINOIS
Emulsions, Inc.—*Lawrenceville*

INDIANA
Bituminous Materials Co.
P. O. Box 1140, *Terre Haute*
Wabash Valley Asphalt Co., *Terre Haute*
Walsh & Kelly
R. R. No. 2, *Gary*
Brookman Construction Co.
17th & Gharkey Sts., *Muncie*
Fauber Construction Co., *Lafayette*
Asphalt Materials & Construction, Inc.
960 East 22nd, *Indianapolis 2*
Bituminous Materials Co.
E. Swihart St., *Columbia City*

IOWA
Bituminous Materials & Supply Co.
409 Fifth Street, *West Des Moines*
Plants: *Spirit Lake, LeMars, Carroll, Algona, Lehigh, Davenport*

KENTUCKY
Emulsified Asphalt Co.—*Kuttawa*

LOUISIANA
Bituminous Materials Co.—*Metairie*
Serving Mississippi and Louisiana

MAINE
Doherty and Swearingen Co.
53 Main St.—*Yarmouth*

MASSACHUSETTS
James Huggins & Sons, Inc.
Medford & Commercial, *Malden 48*
Koppers Co., Inc., Railroad Ave., *Westfield*

MICHIGAN
Bituminous Materials Co.
318 Atlantic St., *Bay City*
Bituminous Materials Co., *Escanaba*
Bituminous Materials Co.
416 S. Water St., *Jackson*

NEW YORK
Koppers Co., Inc., *Utica*
Koppers Co., Inc., Knight Paving Products Dept., 1655 Union Rd., *Gardenville*
Koppers Co., Inc., Knight Paving Products Dept., Vine Street, *Ithaca*
Koppers Co., Inc., Knight Paving Products Dept., 1980 East Ave., *Rochester 10*
Koppers Co., Inc., Knight Paving Products Dept., *Watertown*
Koppers Co., Inc., Knight Paving Products Dept., *Syracuse*
Albany Asphalt & Aggregates
75 State St., *Albany*
Bimasco, Inc., (*2 plants*)
312 Brook St., *Bayshore, L.I., N.Y.*

OHIO
C & C Emulsions—*Van Wert*

SOUTH CAROLINA
Seaco Incorporated
2700 Industrial Drive, *Columbia*

TENNESSEE
Asphalt Products Co., Inc.
Powell Ave., *Nashville 4*
East Tennessee Emulsion Co.
3107 McClure Lane, *Knoxville*

CANADA
T. J. Pounder & Co., Ltd.
1474 Wall St., *Winnipeg, Man.* (*4 plants*)

Eastern Representative:
John A. Dow
157 Church St., *New Haven 10, Conn.*

Proven Paving Construction with McConnaughay Asphalt Emulsions

Emulsified Asphalt
Hot Mix—Surface

Skid-Resistant
Emulsified Asphalt
Hot Mix—Surface

All McCONNAUGHAY Licensees (list on page facing this ad) are prepared to furnish

ALL GRADES OF ASPHALT EMULSIONS,

each the best of its type.

Be sure of fast, dependable service on asphalt emulsions and mixes by calling your nearest McConnaughay Licensee or contact the main office in Lafayette, Ind.

Emulsified
Asphalt Seal Coat

Emulsified
Asphalt Road Mix

K. E. McCONNAUGHAY LAFAYETTE INDIANA

EMULSIFIED ASPHALT *PLANTS AND PROCESSES*

. . . for more details circle 331 on enclosed return postal card

Bituminous features appear
between pages 150 through 164

Some Factors That Affect Quality of Bituminous Construction

By C. K. Preus

Materials and Research Engineer,
Minnesota Department of Highways, St. Paul

Let us consider the basic purpose of this Workshop Meeting of bituminous contractor personnel and engineers in the Minnesota highway program. As I understand it, the aim is to help you as contractor people to produce better bituminous surfaced roads.

To make these roads better you might think the engineers could simply design them to be stronger—beef them up, "hell for stout," so to speak. But surely this is not the solution that is in mind. To take that approach would simply be adding to the cost per mile. This, obviously, we cannot afford to do from an economic standpoint.

We must recognize that the competition of different pavement types requires that the selection must be justified on an economic basis. To accomplish this, a pavement must be built as economically as possible, with the assurance that it will be capable of performing its proper function.

It goes almost without saying that poor workmanship in the building of flexible pavements makes it necessary to add more materials and increase the pavement thickness, in order to off-set the detrimental effects of poor workmanship. If past experience tells the designing engineer that he must expect a certain amount of poor or mediocre work, he must increase his safety factor if he is to be reasonably sure of obtaining a pavement which will do the expected job. Naturally, such a practice will add to the total cost.

The better the pavement is constructed the better it will serve. Therefore, in the long run the contractor has a definite stake in seeing to it that workmanship is the best he knows how to provide. The more uniform and constant the pavement components can be built —both the surface courses and the base courses—the more predictable will be their performance. From a designer's view this is important in trying to arrive at a point where design can become more a science than an art. It has often been said that the design of flexible pavements today is just the reverse, more an art than a science. This is partly due to the fact that the behavior of the different components is not sufficiently predictable. Non-uniform production and construction resulting from poor workmanship certainly aggravate this.

One of the direct consequences of this debate over quality and pavement types is the development of the quality control program by the National Bituminous Concrete Association.

The engineers in the Minnesota highway department, and in other highway departments as well, also have a stake in wanting to secure better bituminous-surfaced roads. We as engineers must get value for the taxpayers'' dollars. We have seen a tremendous increase in traffic demand that has literally destroyed many miles of roads built too light to stand the punishment.

The highway engineers may have been responsible to a degree for

Continued on page 154

This article brings Roads and Streets readers the substance of a talk which Mr. Preus gave at the Fourth Annual Asphalt Workshop of the Minnesota Bituminous Pavement Association. Conference theme: "Bituminous Equipment Operation and Lay-Down Procedures."

ASPHALT

FROM ESSO STANDARD

PROVIDES THREE WAY BENEFITS: Taxpayers, contractors, and motorists — all benefit in three important ways by paving their local roads with Asphalt.

LOWER COSTS FOR THE TAXPAYER. Asphalt can save 10% to 50% in initial construction costs.

EASE OF CONSTRUCTION. Asphalt roads paved in ribbons are completed faster. No expansion joints, forms or curing time required. Contractors can meet faster schedules, obtain contract payments more quickly.

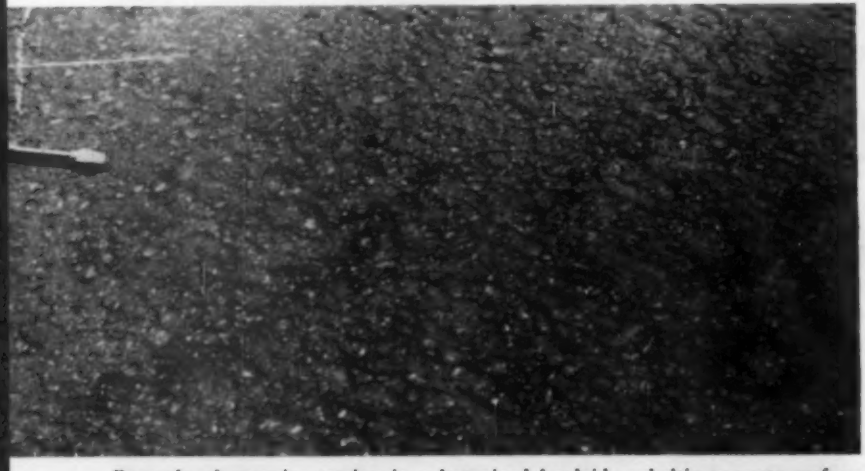
SMOOTHER RIDE FOR THE MOTORIST. Continuous, flexible asphalt paving gives the smoothest ride. Reduces tire hum and vibration to a minimum. For more information, call or write: Esso Standard, Division of Humble Oil & Refining Company, 15 West 51st Street, New York 19, N. Y.

Esso

ASPHALT PRODUCTS

In Industry after Industry..."ESSO RESEARCH works wonders with oil"

Example of a well built bituminous surfacing job, showing the finished mat and bituminous surfaced shoulder, the latter having a heavy seal coat with light colored coarse aggregate for shoulder delineation.



Example of excessive tearing in a hot-mixed hot-laid asphaltic concrete surface, caused by too low temperature during placement.

A poor bituminous seal coat job, caused by faulty adjustment of the distributor bar, as shown by the streaky appearance.

BITUMINOUS QUALITY

Continued from page 152

what might be called inadequate design and insufficient strength in these roads. But, we can no longer afford to run the risk of taking chances such as we may have done in the past. Therefore, it is vital to us that the pavements be so constructed that they will perform in the manner that we expect when we design them.

Where Contractors Fall Down.

Where do contractors fail in their responsibility toward the production of good work?

From the viewpoint of the highway engineers, there are several ways in which the contractor may jeopardize the quality of the road construction.

1. *Efforts at high production and plant output that result in exceeding the equipment capacity,* may well contribute to a mediocre product. It may be a gravel plant, a drier, a mixing plant or what have you, but if it is continually being crowded it is almost inevitable that control of the product will suffer at some time or other.

You may say that the highway department sets unrealistic time schedules which force the contractor into such operational procedures. This is scarcely a good excuse for trying to get along with less equipment than should be available for doing the work within the allotted time. We do not set any limit on the amount of equipment and personnel the contractor may use.

Often, too, the weather is given credit for shortening the available working time. But on the basis of past experience and the best judgment of the engineers, the time schedules do take into account the weather probabilities.

2. *Inadequate contractor's supervisory control* sometimes is a contributing factor. The contractor may at times not have enough supervisors on the job or, the supervisors may not exercise the kind of control over their own operations that is necessary to produce the quality of work expected.

You may counter with the argument that the state does not pro-

Continued on page 156

Introducing

a new member of
the H & B family

C. J. HORNER CO.
Incorporated
WHOLESALE JOBBERS

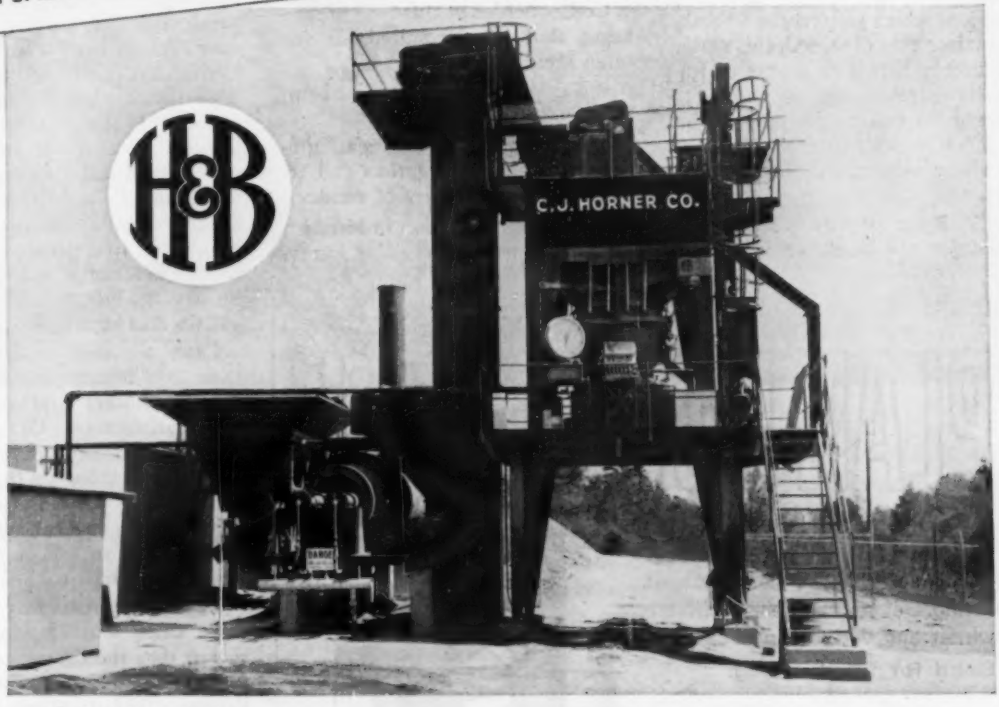
HOT SPRINGS, NATIONAL PARK, ARKANSAS

Here's what the C.J. HORNER Co. says about their H & B T-20A Asphalt Plant . . .

We have never yet had occasion to operate for a prolonged period at maximum capacity, but this plant has easily handled our every demand. Our products have been recently accepted by the Arkansas State Highway Department and for some time we have been selling this county and various neighboring municipal departments. All of whom are highly pleased with our products, as evidenced by their repeat orders.

We should be happy to have any interested parties visit us at any time to see this plant in operation, and we feel confident they will be as pleased as we are with the fine way it performs.

J. M. Callahan



Features of the plant include:

Feeder—27 yd. cold aggregate hopper with 3 plate 10" reciprocating feeder

Dryer—54" dia. x 18' long single unit type with exhauster, primary dust collector, & high pressure gas burners

Gradation Unit—4 compartment 20 ton hot aggregate hopper with 4 deck Deister horizontal vibrating screen

Filler dust elevator & feeder system to aggregate weigh batcher

Air control of hot bin, aggregate batcher, & mixer gates, with 44 cfm air compressor

H & B Fluidometer system, with automatic resetting control head for batch metering of asphalt

Mixer—2000 lb. jacketed type with replaceable liners & tips

A/C Pump—90 GPM jacketed type with by-pass, relief valve, & strainer

Hot Oil Heater—Hy-Way 26 RS gas fired unit

A/C Storage—2 underground tanks with individual tank temperature controllers

HETHERINGTON & BERNER INC.

A Wholly Owned Subsidiary of American Hoist & Derrick Company

701 KENTUCKY AVENUE • INDIANAPOLIS 7, INDIANA

Export Dept: 205 W. Wacker Drive, Chicago, Illinois

. . . for more details circle 313 on enclosed return postal card

BITUMINOUS QUALITY

Continued from page 154

vide adequate inspection personnel, whether in quality or in numbers. As a matter of fact, our engineering supervision costs on construction have been steadily mounting to the point where they have been excessively high in many cases. This is a matter of serious concern to us. Perhaps the state is doing more supervising and providing more engineering services than it should. Possibly the time is coming when the contractors may have to provide more of their own engineering services and supervision.

For example, in providing adequate grade controls, on one of our 1959 jobs which yielded the smoothest surface ever obtained, this result was accomplished by virtue of unusually extensive staking and bluetopping for control purposes. The engineering costs in this case were far above normal for that type of project.

3. *The use of equipment not suited for the work, or in a bad state of repair or adjustment,* can cause poor results. Sometimes a contractor is quite insistent upon continuing to operate such equipment despite inferior work. It appears that at times our field engineers are too lenient in allowing the contractor to keep on experimenting. The trials continue day after day, sometimes even until the work is almost completed. Then when the project is finished there may be an argument as to whether or not the work in question is to be accepted for full payment. Everyone would probably be better off, in the long run, if the work was shut down until the procedures, the equipment or the materials have been definitely corrected.

Consequences of this type of situation that have resulted all too often are:

a. Rough-riding plant-mixed surfaces.

b. Fluctuations in aggregate gradation causing segregation and resultant non-uniformity of product.

c. Excessive variation in bitumen content, sometimes resulting in raveling or in flushing under traffic.

d. Poor seal coats, where streaking and fluttering produce an unsightly and unsatisfactory seal.

4. *Lack of willingness by contractors' personnel to recognize the need or value of certain specification requirements,* may at times account for poor workmanship.

Our specifications are the product of a gradual evolution, and generally are the result of the experience and judgment of many individuals. These requirements are considered to be the limits which will insure satisfactory results, and beyond which there is too great a chance for poor results.

At times a contractor may feel that if the *average* of his aggregate production, or densities, or moisture content is within the specified limits, that is all we should expect. This is not what the specifications require. If the average just barely passes, then nearly 50 percent of the values must fall outside of the limits. Some of the failing values may be far outside the limits; and a chain is no stronger that its weakest link. Therefore, the mere fact that the average meets the requirements has no real significance.

Cases are cited where specifications have been waived for one reason or another and results have been satisfactory. Or we are reminded that bituminous surfaces have been placed in freezing temperatures (as was done for instance in the Aleutians), or surfacing has been placed on top of moist bases without detriment.

These arguments may be true in some cases, but experience has shown that the chances are against success under such conditions. Furthermore, if failure occurs the state usually is left holding the bag for the cost of repairing the failed work.

The Why of Specifications

Now, since I have pointed the finger, so to speak, at the contractor, I expect that the reaction will naturally be that the highway department itself is at fault for various deficiencies—in design, in specifications and in construction supervision. I expect, for example, this kind of response: "The state tells

Continued on page 158

PLAN NOW!
6 to 60 ton models at low cost
Plan now for delivery of your asphalt plant when YOU need it. Don't risk delayed delivery next spring. Get your share of profitable winter and early spring business!
Send for free catalog.
White asphalt plants
White Mfg. Co., Elkhart 2, Indiana
Please send catalogs on low-cost asphalt plants.
Name
Address
City
State
. . . for more details circle 350 on enclosed return postal card

Portland Profits By Resurfacing Streets With CATIONIC BITUMULS

Distributor applies Cationic Bitumuls at 0.2 gal./sq. yd. Note "skirt," designed to protect against drift or splash.

Truck immediately applies 25 lbs. of cover stone (¼" - #10) using tail-gate spreader. Two passes by three-wheel steel roller completes job.

The City of Portland, Oregon, is about to complete its second successful season of Single Surface Treating city streets using Cationic Bitumuls.

Last year, Cationic Bitumuls was used on more than 80% of a total of over one million square yards of such work. Costs averaged out at about 12 cents per sq. yd. as opposed to 16½ cents for similar work using an asphaltic cutback. This year, the program will include at least 800,000 square yards. Conservatively, this means a saving of over **$70,000 in two years!**

Here's the type of tightly bound surface being put down with Cationic Bitumuls in Portland, Oregon.

WHERE THE ECONOMY DEVELOPS

According to officials in Portland, the savings can be traced to the following factors: less aggregate required; smaller crew; less binder; faster operation.

In addition, Cationic Bitumuls holds even siliceous aggregates. And it extends the working season because it gives extra protection against wash-off of binder when early rain is encountered.

FUTURE PLANS

Current plans call for a continuing program involving the resurfacing of 50 to 60 miles of streets each year. At this rate the City will continue to save approximately $35,000 per year as compared to earlier methods.

Investigate the benefits of using Cationic Bitumuls in your street and road work. Call our nearest office for full information, today. Your community, too, can **profit** just as Portland is doing.

American Bitumuls & Asphalt Company

320 MARKET, SAN FRANCISCO 20, CALIF.
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
Tucson, Ariz.
Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

BITUMULS® Emulsified Asphalts • CHEVRON® Paving Asphalts • LAYKOLD® Asphalt Specialties • PETROLASTIC® Industrial Asphalts

. . . for more details circle 278 on enclosed return postal card

Typical "black stack" indicating overcrowding of the drier in a hot-mix plant. This reflects not merely a production bottleneck but also a possible source of trouble in meeting specifications.

BITUMINOUS QUALITY

Continued from page 156

us what to do, how to do it and when to do it. Then when the results turn out badly, it's our fault. How can we be held responsible for a product under such circumstances?"

An argument that is becoming increasingly common is that we should be using more "end-result" specifications; let the contractor use his ingenuity and do the work as he sees fit, and then judge the finished product only. As a matter of fact, we already have certain requirements in that direction; density and moisture of bases and subgrade, density of bituminous courses and job-mix formulas for asphaltic concrete are examples. Perhaps we should have more of this type of requirements. I don't say that we should not.

But, have you stopped to think what it would mean to you as contractor people—and to us engineers—if we were to go all the way on this and say in effect: "Build us a flexible pavement on this road, to consist of a 24 ft. wide asphaltic concrete surface 4 in. thick over a 4-in. bituminous base, on top of a granular base course 12 in. thick, all to the exact cross section and grades shown in the plans. The bituminous courses and the granular base shall have minimum strength or stabilities of such-and-such amounts. The thicknesses, the cross-section and the profile shall not vary by more than so much from the plan. When the work is completed the state will check on it, make measurements and tests to determine thickness, density, moisture content, stability, cross-section, profile, riding, quality and the like. Failure to meet the requirements will be cause for rejection."

This example may be greatly oversimplified, but it is certain that if the idea of end-result specifications and final product acceptance were to be carried out literally, the contractor would have to take much greater precautions than he does at present to assure himself that he is continuously producing within the required limits. He would have to be manned with qualified, trained personnel and equipment to perform tests to control the quality of his product. Some of you, I believe, may have had experience already with this type of specifications.

Under our present system of engineering inspection, so far as quality is concerned, the contractor relies almost entirely upon the state's engineering forces to determine whether or not he is complying with quality requirements. The contractor's personnel generally concern themselves more with checking on quantities involved in payment schedules than on quality control. Possibly, to repeat, the highway department is devoting too much engineering effort to control which should perhaps be the contractor's own responsibility to a greater degree. Are you ready to assume that responsibility and the consequences that would go with it, if it were to become necessary to do so?

Our construction specifications today are a combination of procedural control and end-result requirements. I think you will find that the specifications of a great many other states are likewise a combination of the two. Use of the procedural requirements serves as a guide to the contractors in bidding. With no such requirements of any kind, there might be more uncertainty for the contractors as to what will be expected of them. These requirements also provide a yardstick for measuring the work accomplishment of the contractor, certainly much more definite than terms such as—"to the satisfaction of the engineer."

There is another aspect of specifications that I want to mention briefly. It seems that there is a notion—at times among some of our own engineers as well as among contractor personnel—that if the work is done strictly according to the specifications, this should practically guarantee that the product constructed should be immune to any type of failure. If only this were true, it would make life much simpler for all of use, but unfortunately it doesn't necessarily work out that way.

For example, the mere fact that a subgrade has been compacted to 100 percent density and with moisture content within the specified limits does not prevent ruts from forming under the concentrated traffic of gravel hauling trucks. We have discussed this very problem in previous meeting of this Workshop. Now we have added another requirement—that of test rolling—in an effort to provide a better measure of the strength or adequacy of the subgrade.

Even test-rolling however is not a sure-fire guarantee. It, too, has its limitations. And, so it may be with other specification requirements. Therefore, we must recognize these requirements for what they are in most cases—working tools, guides, and yardsticks to measure work accomplishment, and a basis for providing uniformity of bidding on the work.

This is the heart of our contract system of doing work, and the contractor and engineer alike must recognize the specifications as the rules of the game for us all to follow.

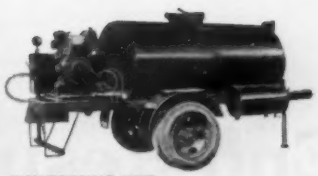
ASCE Acts on Surveying and Mapping Policy

The Board of Direction of the American Society of Civil Engineers has acted farther on its policy which declares four major categories of surveying and mapping to be professional activities in the civil engineering field. These are land surveying, engineering surveying, geodetic surveying and cartographic surveying (including photogrammetry).

The committee recommended publicizing, educating and informing all parties concerned, particularly by letters from ASCE headquarters with special attention to those who in the past have solicited bids for such services.

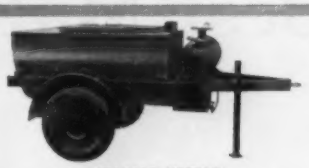
This approach would include procurement agencies of large industrial firms and government agencies; also administrative officials of the states will be personally informed so that they will support the professional policy, i.e., that bids are not properly required for such services.

BITUMINOUS DISTRIBUTOR
Front or rear mounted for truck or trailer . . . with pressure metering.



MAINTENANCE UNIT
Heating and spraying unit . . . 2-wheel or truck mounted.

STREET FLUSHER
Truck mounted as shown or 2-wheel model for towing.



ASPHALT KETTLE
2-wheel pneumatic mounted . . . hand or power spray.

Smartest buys of the year

ROSCO ROAD EQUIPMENT

for construction and maintenance of highways, streets and airports

ROLLER
9-wheel self-propelled . . . torque converter, power brakes and steering.

ROSCO-PACTOR
9 or 13 wheel roller . . . 90 to 125 cubic feet capacity.

ROAD SWEEPER
Two-way . . . power driven . . . full 4-wheel trailer mounted.

STREET CLEANER
Power driven . . . for sweeping and flushing.

Years of use by satisfied customers prove Rosco machines are built to last . . . built to turn out a top-notch job every time. For full details on the dollar-saving specifications ask for literature on the equipment you need.

ROSCO MINNEAPOLIS

ROSCO MANUFACTURING CO.
3118 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

☐ Bituminous Distributor ☐ Street Flusher ☐ Roller ☐ Road Sweeper
☐ Maintenance Unit ☐ Asphalt Kettle ☐ Rosco-Pactor ☐ Street Cleaner

Please send literature checked below to:

Name_____ Title_____

Company_____

Address_____

City_____ State_____

. . . for more details circle 339 on enclosed return postal card

End-Result Rolling Produced Best Mat Densities

Asphaltic concrete pavement layers placed in the Minnesota state highway program in 1959 were constructed under two different types of density control specifications. On 19 projects, the *required density* was specified but not the rolling method. On 20 jobs no density limit was stated but the contractor was given a *rolling requirement*.

The former jobs produced, on the average, a somewhat higher and more uniform density according to an annual review of Minnesota bituminous road work by J. A. Murchie, bituminous engineer for the Minnesota department of highways.

This pattern of results makes news beyond state borders, because of the wide controversy over whether to adopt end-results type specifications for various phases of highway work. Just what the Minnesota experience means would depend on a better understanding of a number of factors, such as the degree inspection control, indoctrination of the contractors, etc.

The densities obtained for various types of mix under the two procedures are shown in the accompanying tables. The "Specified Density" requirement is based on the 50-blow Marshall test. Only one job during the year brought difficulty in achieving the minimum requirement. The initial failure of this job was attributed to a lack of coordinated effort to get adequate rolling at the proper temperature. All of the test points were subsequently brought up to specified density by additional rolling at considerable expense to the contractor.

The "Rolling Requirement" tabulation includes figures for a single Marshall laboratory test for the surface course.

Similarly the designed residual air voids in the compacted wearing course mixtures (and consequently the probable durability of the surface) are found more controllable when the mixture is compacted to a specified density, notes this review. The air void results are also here tabulated. The range shown for "design" void content is for specimens compacted to 100 percent of Marshall density.

This review by Mr. Murchie also covered other points of interest. The state's 1959 program saw completion of 2,012 miles of bituminous surfacing or repair work. Half the mileage consisted of new construction, done under 162 contracts. There was 780 miles of sealing under seven contracts. State forces handled 211 miles of repairs. Of the various classes of mix, the single-aggregate plant-mix type (No. 2331) continued to be in the lead as an economic choice under this state's pattern of aggregate availability and traffic conditions.

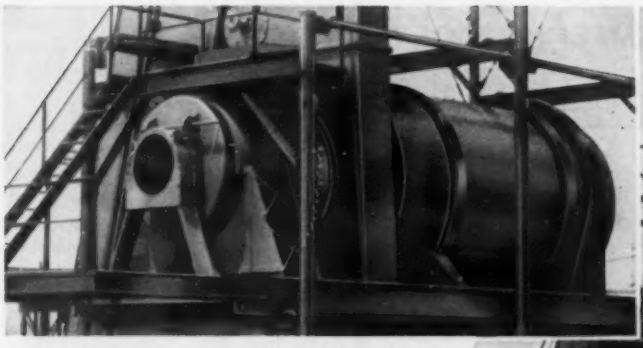
The program utilized 32,800,000 gal. of asphalt and tar materials, as tabulated.

Road-mix construction totaled 843 miles using 1,110,000 tons of mix. While travel plants produced the bulk of this tonnage, 86,000 tons was produced as hit-mix in sta-

Minnesota Bituminous Surface Work Completed in 1959

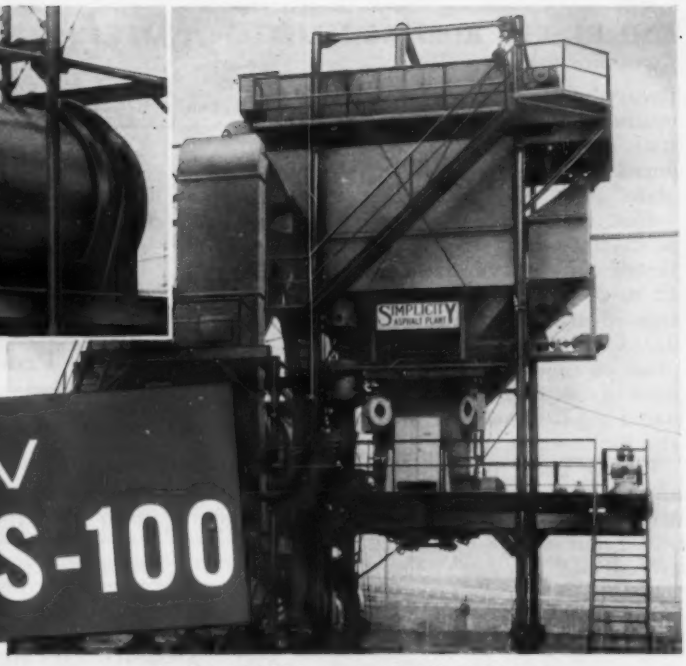
Type of Surfacing (Spec.)	Departmental Section					Number of Contracts
	Construction	Maintenance Contract	Maintenance State Forces	State Aid	Total	
Asphaltic Concrete (2351)	2.1	-	-	-	2.1	2
Plant-Mix Surface (2341)	120.7	-	-	2.5	123.2	29
Plant-Mix Surface* (2331)	139.9	1.8	-	105.9	247.6	42
Road-Mix Surface (2321)	40.9	36.9	167.0	399.7	644.5	99
Road-Mix Base (2208)	131.7	-	0.3	227.1	359.1	60
Bit. Seal Coat (2356)	8.5	83.1	-	-	91.6	16
Light Seal Coat (2357)	20.7	696.2	5.3	53.6	775.8	16
Fog Seal	3.9	-	-	10.6	14.5	5
All Plant-Mix	255.1	1.8	-	108.4	365.3	61
All Road-Mix	138.5	36.9	167.3	507.2	849.9	126
Seal Coat Only	-	779.3	5.3	12.5	797.1	8
Total	393.6	818.0	172.6	628.1	2012.3	195

*Single-aggregate mix.



New Simplicity 9x16 Double Shell Dryer

NEW Simplicity S-100



Simplicity S-100 Tower has long been known as the most dependable in the industry.

The **NEW** S-100 Plant brings you the newest developments based on 35 years devoted exclusively to building and operating the most **DEPENDABLE** asphalt plants that can be made.

The **NEW** Simplicity 9 x 16 Double Shell Dryer has improved breeching plus easy access for maintenance and a new and improved design of combustion chamber with manual, semi-automatic or fully automatic temperature control. Outstanding fuel economy, dependability and durability are built into this new dryer just as it has been built into every Simplicity dryer for the past 35 years.

OVERSIZE 5′ x 14′, 2½ deck screen with 180 square feet of screening area. **6000 POUND MIXER** (65.6 cu. ft. below shafts) with manual, semi-automatic or fully automatic weighing, batching and mixing. Renewable manganese steel liner sections—area of primary wear can be quickly and economically relined.

No price increase for more than a year. Note that Simplicity prices are published and are the same to everyone with no commissions and **NO PADDING** for glamorous looking but phony trade-in allowances.

There is a Simplicity of the right size for your requirement. *Get the facts before you buy any asphalt plant.*

There's a Simplicity Plant near you. We'll be glad to send you the name and location of a nearby installation.

Model	S-80	S-100	S-200
Rated Capacity (T.P.H.)	75 to 100	100 to 150	150 to 200
Dryer Volume (Cubic Ft.)	603	1,018	1,571
Dryer Speed (R.P.M.)	12	11	9
Air Volume (C.F.M.)	30,000	35,000	40,000
Fan Speed (R.P.M.)	900	800	800
Screen Area (Sq. Ft.)	96	180	180
Screen Speed (R.P.M.)	800	800	800
Bin Capacity (Tons)	50	50	85
Weighing Capacity (Lbs.)	6,000	7,500	10,000
Mixer Capacity (Lbs.)	5,000	6,000	8,000
Mixer Volume**	50.63	65.6	93.1
Mixer Speed (R.P.M.)	56	50	45
Total Weight	187,385	228,865	262,535
Total Price*	$94,500.00	$116,400.00	$132,800.00
Price Per Pound	.504	.508	.505

* Prices subject to change without notice. ** Cu. Ft. Below Shafts.

(NO PRICE INCREASE FOR MORE THAN A YEAR)

DEPENDABLE

THE SIMPLICITY SYSTEM CO.

SHOLAR AVENUE • PHONE MAdison 2-2144

CHATTANOOGA 6, TENNESSEE

THE SIMPLICITY SYSTEM — FROM BUILDER TO BUYER BETWEEN MEN WHO KNOW

. . . for more details circle 340 on enclosed return postal card

END RESULT ROLLING

Continued from page 160

tionary plants, under 14 different contracts, at no extra cost to the state. Another 51,700 tons was produced as cold-mix in a central plant.

Hot mixed asphaltic concrete production of 999,200 tons was turned out by 22 contractors using 12 batch type and 14 continuous type plants. One contractor produced 188,320 tons with a single plant on four projects totaling 44 miles of construction. Another produced 115,400 tons with one plant, also for 44 miles.

Hourly plant producti- n rates appear to be increasing, noted Murchie. One contractor produced 96,000 tons for a project at 200 tph average rate. Another averaged 210 tph.

As in past years, a carry-over of work was reported for Minnesota at season's end. The 1959 carry-over of 510,000 tons under contract was somewhat higher than the 7-year average, due to exceptionally wet autumn weather.

Quality control of hot-mix production in general gave the Minnesota engineers no acute problems during the year. Only one 20-mile project required special field tests for control. All other quality tests were made at the department's central laboratory. (Routine production control tests are made on the job)

Another job is still under study —the one for which the contractor averaged 210 tph plant production. Incomplete mixing resulted in accelerated surface deterioration in some areas amounting to only 0.06 % of the total job.

On another job a short section of surface course was laid with 0.5 percent less asphalt than specified. The leanness was traced to inadequate control of asphalt temperature during mixing, a situation soon corrected. The affected area was given a fog seal to protect against traffic abrasion.

"The difficulties encountered on these few jobs," commented Murchie, "indicate a need for more effective inspection control and more rapid remedial action on the part of the contractor." The current trend toward higher rates of production, Murchie feels, emphasizes the need for a physical field test to

Tons of Road-Mix, 1959 Minnesota Work

Section	Type of Mixture: Bit. Base	Type of Mixture: Surface	Total
Construction	138,498	204,122	342,620
State Aid	92,965	520,934	613,899
Maintenance (Contr.)	-	47,140	47,140
Maintenance (S. F.)	200	112,039	112,239
All	231,663	884,235	1,115,898

1959 Hot-Mix Production on Minnesota State Jobs

Mixture Specification	Tons Produced	Miles Constructed	No. of Contractors	No. of Plants	Hours Worked	Production Tons/Hr.
2351	26,201	2.1	9	9	316	80
2341	402,346	123.2	16	18	2911	135
2331	570,674	247.6	19	21	3675	153
All	999,221	373.3	24	28	6902	142

Density Obtained by "Specified Density"

Mix Spec.	No. of Jobs	No. of Tests	Percent of Field Marshall Density: Req'd	Avg.	High	Low
2351	5	25	97+	98.0	98.4	97.4
2341	19	412	95+	97.1	101.8	95.0
2331	6	127	90+	95.0	98.4	92.1

Density Obtained by "Rolling Requirement"

Mix Spec.	No. of Jobs	No. of Tests	Percent of Lab. Marshall Density: Avg.	High	Low
2351	1	7	101	102	100
2341	5	74	95	97	93
2331	14	262	93	95	91

Air Voids in Wearing Coarse Compacted by "Specified Density"

Mix Spec.	Design	% Air Voids in Pavement: Average	Low	High
2351	5-8	6.2	5.0	7.7
2341	3-8	6.4	4.3	10.1
2331	-	-	-	-

"Rolling Requirement"

Mix Spec.	Design	% Air Voids in Pavement: Average	Low	High
2351	5-8	2.9	5.0	3.3
2341	3-8	8.6	6.8	10.8
2331	3-10	13.5	11.1	15.7

determine the uniformity of the mixture being produced. This test (or tests) should show the completeness of the bituminous coating as well as the properties of the bitumen and aggregate.

During the 1960 season studies of mixing characteristics are being made for each producing unit, to determine the thoroughness of mixing at the production rate.

A marked improvement in riding smoothness was reported for Minnesota bituminous roads completed during 1959. A roughometer was used extensively to determine the roughness of binder and base courses prior to placing surface course. This helped tighten procedures on many projects. In general the inspectors gave closer attention to the paver's condition and adjustment, as well as to subgrade accuracy. In several cases pavers were allowed to exceed the state's primary specified 30 ft. per min. limit of travel speed because of good smoothness results being obtained. Some pavers operated at 47 feet per minute.

Seal coat operations included 711 miles of lights and seals using approximately 0.1 gal. per sq. yd. of cut-back asphalt or asphalt emulsion and 10 lb. of sand. Heavy seals consisting of approximately 0.2 gal. and 22 lb. of pea rock per sq. yd. were placed on 92 miles of road. This work was under the supervision of the Maintenance Section. Minnesota has 868 miles of unsealed hot-mixed surfaces which have been in service for up to four years. The traffic on these sections ranges from less than 400 to as high as 40,000 vehicles per day.

Among the special bituminous projects in the year, two were built with bituminous stabilized sand base in the absence of readily available, high type gravel. The fine sand was mixed with 5 to 6 percent of SS-1 asphalt emulsion.

Shoulders of hot-mixed materials have begun to enter increasingly into the Minnesota program, as in other states. Some 85 miles of such shoulders were constructed. Along concrete, the shoulders were left unsealed for color contrast; along 76 miles of bituminous road, shoulders were sealed with RC-5 and ½-in. pea rock of light color. Newly developed shoulder paving machines were used for most shoulder jobs.

Views And Comments

By H. G. Nevitt

Clay–The Problem Material

Practically every highway engineer will agree that a clay basement soil, or excess clay in the base or pavement, is likely to be a source of expense and perhaps trouble. Many, however, do not appear to be concerned over lesser amounts in these structural layers. Yet it is now being realized that secondary difficulties from clay, as they might well be described, can be a source of serious trouble.

This is in some respects a new development. Years ago aggregates bearing any considerable clay fraction would be rejected for use, or washed to make them suitable, with filler added if necessary. Nowadays the shortage of really good materials, and the need for eliminating extra processing or the use of expensive filler, make it desirable to use these clay bearing aggregates if the amount and type of clay present will permit.

Correspondingly a better understanding of the possible effects of such clay, and accurate methods for the control of the amount and type, seem desirable. We will attempt to bring out the present status of this situation to the extent of our knowledge of it.

It is important to note that the type of clay is a factor as well as the amount. The physicochemical nature of clay components has a considerable bearing on the deleterious effects possible from the clay fraction. Hence some tests, such as for particle size distribution, may not be suitable or sufficient for the need. The older controls used–the shrinkage coefficient might be a good example–may reflect this situation to some extent, but to such limited degree that unnecessarily severe specifications may be required for security with in some cases usable materials unnecessarily rejected. What is needed is a test, or tests, which more precisely indicate the characteristics of the clay content, and/or the amount of undesirable clay types present.

The most notable effort to bring out such a test for practical use that we are aware of can be credited to the California Department of Highways under the leadership of F. N. Hveem. It is called the Sand Equivalent Test, and indicates the presence of such undesirable material, permitting specifications and controls to be established. This procedure has been used for some years, widely on the West Coast and in some foreign countries. Experience with it appears to have been quite satisfactory. We called attention to the test shortly after its initial use, but to our knowledge neither it nor some other test supplying similar information has been adopted for routine use as universally as we think the problem justifies or perhaps demands.

The reason for this may be the deficiency of published data correlating field experience and the test results or, perhaps, the data published have been ample for the need (as the proponents of the test undoubtedly believe) but there has not been the continuing presentation of the further data required to convince the skeptics. Highway engineers are generally reluctant to accept a test merely on the assurance that experience with it in some other area has been satisfactory. Too often some unrecognized variable, constant over the area of satisfactory experience, but different elsewhere, limits the general applicability of tests with only this

type of recommendation. What is wanted instead is an analysis of the problem, along with published evidence that the possible factors influencing the result have been explored with satisfactory conclusions.

Such evidence or additional evidence concerning the Sand Equivalent Test should not be too difficult to procure. The regions in which it has been widely used for some years now should be able to supplement the original published data. Wanted now is something more tangible than a mere statement that since the test's adoption, troubles attributable to the clay fraction present have been lessened or eliminated. However, Mr. Hveem argues, and quite logically, that engineers with an understanding of clay effects should recognize the possibilities in the situation and not demand repeated evidence of the need for such a test.

Other states not using the test are giving it attention. Some are making thorough efforts to correlate the findings of the Sand Equivalent Test with other test data which might more clearly bring out its exact significance and just what it measures; general publication of such findings is needed. We believe these steps will constitute a real contribution to highway technology; as will, of course, be true of the development of other tests which attempt to achieve the same end.

In our discussion we have used the term "indicate" to describe what the Sand Equivalent Test tells us. Some may be confused by this rather vague term, or feel that the test does not directly measure the total clay content or that portion of it which is harmful. The comment we received from Mr. Hveem on this point (and on the running of the test) seems pertinent. We quote: "Therefore, in simple terms, the Sand Equivalent evaluation represents the amount of liquid in which the clay or fine soil fraction remains suspended after a settling period of 20 minutes. This volume appears to be a better index of the potential detrimental properties than does either weight or dry volume proportions. Like all tests, it requires care and precision in performance and a careless operator can certainly produce a wide variation in the results. In this field a single sample of anything is only slightly better than none at all and any procedure that makes it possible to test a large number of samples rapidly is far more reliable than a more scientific time consuming operation. Probably it would be more precise to say that the test serves to indicate the amount or magnitude of undesirable effects which the fine clay-like fraction may be expected to produce".

It seems quite in order to ask what undesirable effects can be prevented through the use of the Sand Equivalent Test. In the base the amount of material which tends to cause volume change and loss of stability is stated to be indicated by the test. It is of course true that these characteristics can be brought out by other approaches. However, the Sand Equivalent Test—which is a fairly simple and short one, adapted to field use—provides a preliminary or screening evaluation for design purposes and a simple control in the field.

In the mat the possibilities are less apparent but equally valuable in situations where the use of aggregates carrying clay—sometimes intermittently and inadvertently—appears desirable and feasible from other standpoints. Ordinarily the asphalt used will waterproof the mineral particles, including some of the clay types. If such aggregates carry too large a proportion of the undersirable clay types (and the permissable amount may not be large), water absorption and swelling of the mat may result.

The situation is essentially one phase of the stripping problem but it does not too well respond to the commonly used procedures for detecting and overcoming this difficulty. Visual stripping tests are unsuitable or not too reliable; the diffusion of water through the asphalt films into these clays is rather slow so that the usual immersion compression test may not warn of the full possibilities; and many additives effective in preventing stripping from the other fractions of the mineral aggregate may not function too well with these clays, or such fact cannot be demonstrated with assurance. If the amount of these clays is held to a safe proportion by the use of the Sand Equivalent Test these problems or uncertainties are avoided.

The presence of clay in aggregate may be dangerous in another fashion. If the aggregate particles are coated with clay—and it takes a very small amount of some types of clay to give an effective coating—the asphalt-aggregate bond required may not be established due to the asphalt not penetrating the clay layer to establish adhesion. The effects on the mix of such a situation if it occurs are obvious.

It would appear that a test which is responsive to the type of clay as well as amount has some definite benefits: and if the Sand Equivalent Test is conclusively demonstrated to be a method that provides this information it has much to offer. Evidently this situation needs consideration by all highway building agencies which have, or may through developments be confronted with, problem in the use of clay bearing aggregates.

It should be noted that secondary difficulties from clay, and the steps required to overcome them, is typical of our advancing technology. A more exact knowledge of all the factors that may influence the satisfactory performance of a highway structure, more precise control in the design and construction to keep them under control, are in evidence in every phase of our progress. They are simply better tools to enable the highway engineer to meet his responsibility for providing more and better roads at less cost.

Asphalt Technologists Proceedings Available

A new book containing 17 papers on such subjects as paving asphalts, aggregate gradations, fillers, stability, density, fatigue tests, durability and mixing efficiency is now available as the Proceedings of the Association of Asphalt Paving Technologists. The book may be obtained at a post paid price of $6.50 from Mr. Ward Parr, Association of Asphalt Paving Technologists, Box 619, Ann Arbor, Michigan.

Labor Law

Compensation Question

An employee of the New York Department of Public Works, working on a highway job, was injured while helping a fellow employee move a refrigerator. The refrigerator and the truck in which it was being transported both were owned by the fellow employee, who also was doing the driving. The injured man brought an action against his fellow employee charging negligence.

That brought up the question of whether or not the accident had occurred in the course of the injured man's employment. The jury decided that it had, as it had happened after the highway crew had reported for work and so was under the direction of the Department of Public Works. A verdict for the defendant was brought in on the ground that, as the accident had happened during the course of the plaintiff's employment his exclusive remedy was under the provisions of the Workmen's Compensation Law.

The case was appealed to the Appellate Division of the Supreme Court, which affirmed the verdict, but gave leave to appeal to the Court of Appeals, New York's highest court. That Court in turn affirmed the verdict saying that there was evidence to support the jury's decision that the accident had happened during the course of the plaintiff's employment, but pointed out that its decision in no way precluded the injured man's right to collect workmen's compensation, provided he had complied with the procedural provisions of the Workmen's Compensation Law. (Moon v. Funkle, 159 N.E. 2d 701, 6 N.Y. 2d 831.)

Davis-Bacon Act Inflates Road Costs

The Davis-Bacon Act recently inflated the pay for construction workers at five specific towns across the U. S., the Chamber of Commerce of the United States charges. The towns were Hastings, Nebr.; Waverly, Iowa; Franklin, Tenn.; Columbia, South Carolina; and Selma, Alabama.

This act permits the Secretary of Labor to set wages on government construction jobs or jobs involving federal financing. He is supposed to set rates equal to those "in the city, town, village, or other civil subdivision in which the work is performed," the law says.

The National Chamber charged that the Secretary of Labor flaunted the law in setting rates that prevailed at nearby metropolitan areas, instead of local rates.

At Hastings, a group of Nebraska contractors protested against the high wage fixing, and the Secretary changed the rates to those prevailing locally at Hastings. But at the other towns contractors were forced to pay the Davis-Bacon rates on local construction.

In effect this meant that metropolitan union rates prevailed on the construction, the National Chamber pointed out. When Davis-Bacon was passed in 1931, it was intended to prevent disruption of local wage practices by importation of low-price labor. Now Davis-Bacon is distorted to impose higher wage rates than those that exist locally, the National Chamber said.

Comparisons of local and Davis-Bacon Rates

	Local Rates	Davis-Bacon Rates
Hastings (Nebraska) Airport		
Bulldozer operators	$1.75	$2.80
Metal Pipe-layers	1.60	2.30
Waverly (Iowa) Air Force Station		
Carpenters	2.25–2.50	2.98
Bricklayers	2.50–2.75	3.60
Cement Masons	2.00	2.85
Electricians	2.25–2.50	3.10
Iron Workers	2.25–2.50	3.32
Laborers	1.25–1.65	1.55–1.75
Painters	2.00–2.25	2.35–2.75
Plasterers	2.25	3.35
Plumbers & Pipefitters	2.00-2.25	3.15
Heavy Equipment Operators	2.00–2.50	2.61–3.15
Franklin (Tenn.) Housing Authority		
Plumbers	1.50–1.75	3.55
Electricians	2.75	3.40
Carpenters	1.90	2.85
Brush Painters	1.75	2.75
Bricklayers	2.50	3.62
Roofers	1.85	2.45
Columbia (S. C.), Shaw Air Force Base		
Mechanics	2.00	2.40
Backhoe	2.00	2.40
Bulldozer	1.60–2.00	2.15
Crane, Derrick, or Dragline	2.00	2.40
End Loader	1.75	2.15
Motor Grader	2.00	2.15
Pan Scraper	1.65	2.15
Roller	1.65	2.40
Selma, Alabama, School		
Carpenter	1.75	2.25
Concrete Finishers	1.75	2.85
Concrete Mixer and Traveling Machine Operator	1.50	2.75

New steels are born at Armco

They TESTED our pipe like this 50 YEARS AGO!

Today you have a better check.

When this picture was taken, about 1910, engineers and builders had practically no backlog of experience with corrugated metal pipe. Armco Pipe had been on the market only a few years. So tests such as this gave buyers confidence.

Today there is a better test at your disposal—the test of more than 50 years of actual service. Through these service records you can view the performance of Armco Corrugated Metal Pipe in all kinds of jobs. Storm sewers, sanitary sewers, utility conduits, culverts, tunnels, stream enclosures and bridges are some of the applications in which Armco Pipe has proved itself.

Armco Pipe is a member of a full line of drainage and construction products made and sold by Armco. You can get complete facts on versatile Armco Corrugated Metal Pipe in our new catalog. Use the coupon to order your free copy. Armco Drainage & Metal Products, Inc., 6400 Curtis Street, Middletown, Ohio.

1 2 3

SEND FOR FREE CATALOG

Sixteen pages of Specification and Application Data

Armco Drainage & Metal Products, Inc.
Dept. I
6400 Curtis Street • Middletown, Ohio
Send my copy of the Armco Corrugated Metal Pipe and Pipe-Arch Catalog.
☐ Have representative call.

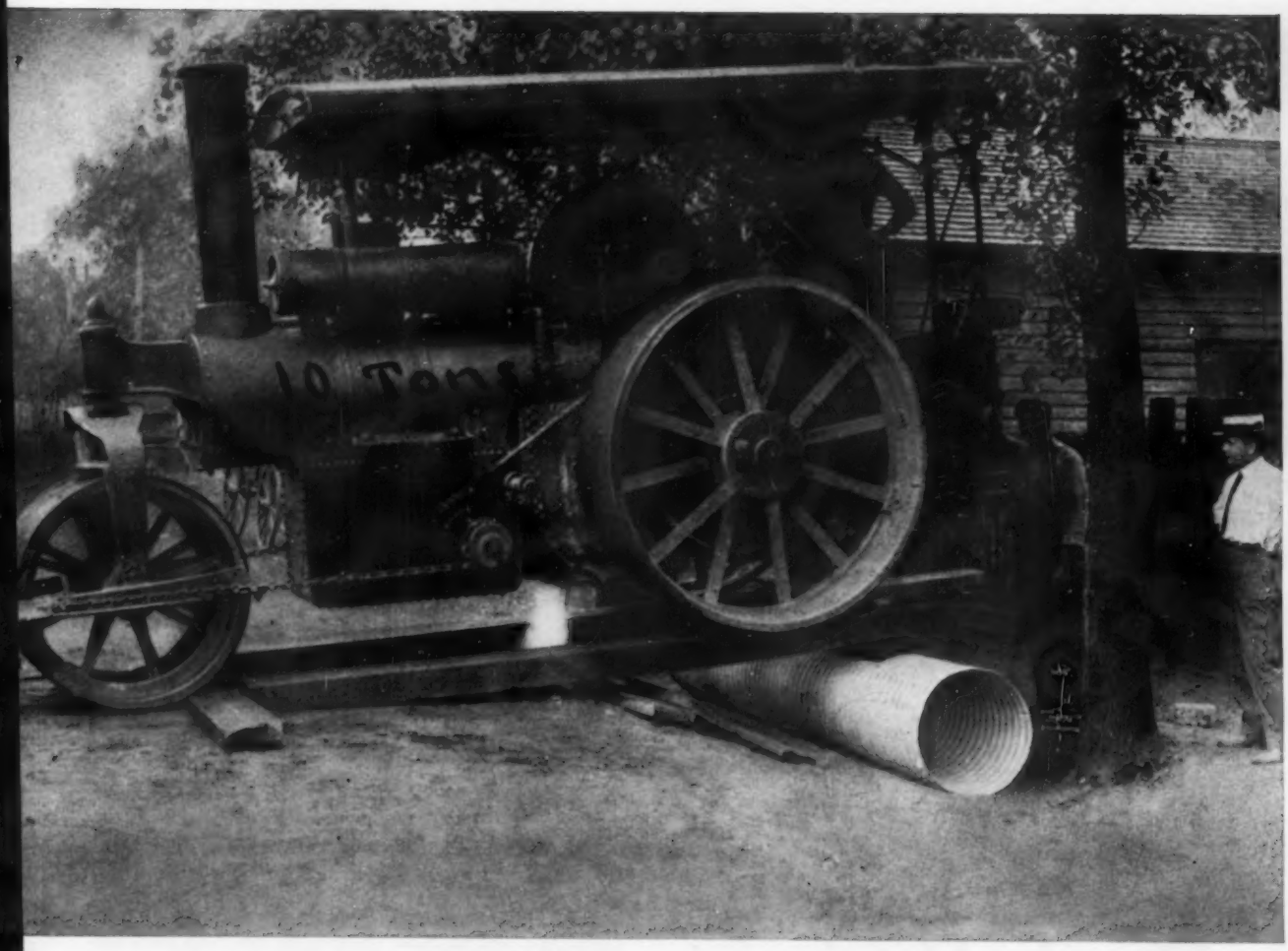
NAME_____

TITLE_____

ORGANIZATION_____

STREET OR BOX NO._____

CITY_____ ZONE____ STATE_____



4

5

1. Inspection shows sewer in Pocatello, Idaho, installed in 1914, is in excellent condition. 2. Armco SMOOTH-FLO® Sewer Pipe being installed for real estate development. 3. This Armco Pipe functions as a conduit for utility lines under railroad. 4. Armco Research Engineer checks 20-year performance record of Armco Pipe under the Pennsylvania Turnpike. 5. Conveyor housing is a 96-inch diameter Armco Pipe.

Steel

ARMCO DRAINAGE & METAL PRODUCTS

ARMCO

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

. . . for more details circle 280 on enclosed return postal card

One of the long-high structural members being snaked around the toll booths on the Calumet Skyway elevated highway in Chicago's south side.

Planning Made 101-Ft Steel Hauls Easier

By Tip Fravel

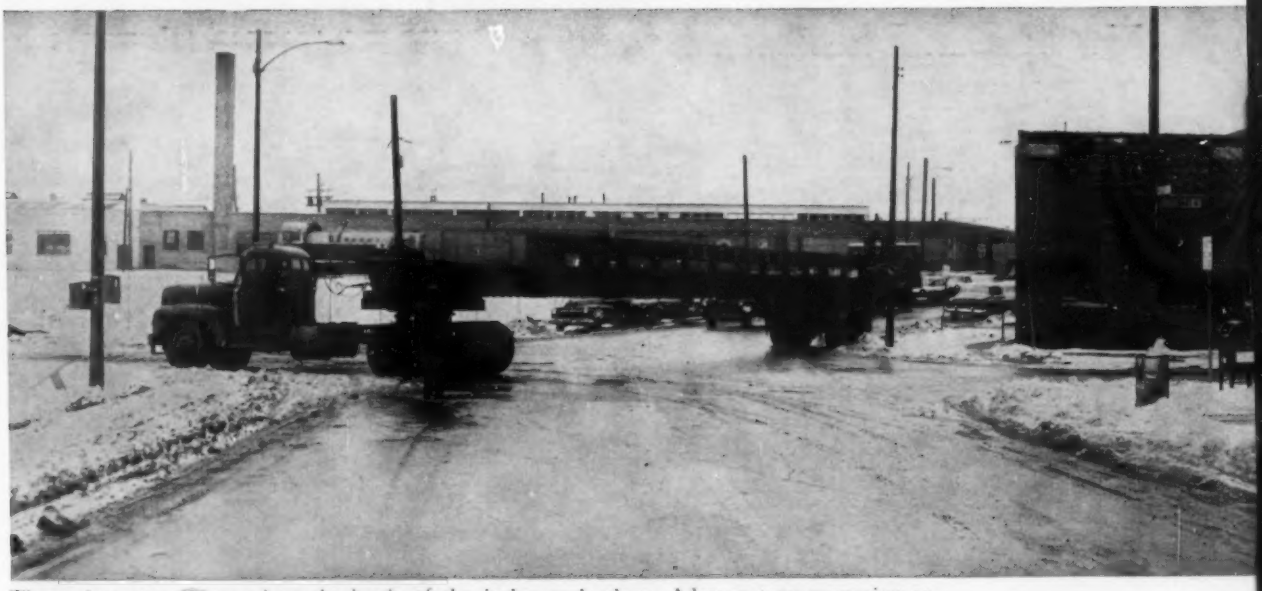
Vice President of Operations, Sims Motor Transport, Inc., Riverdale, Illinois

When it comes to transporting over-size loads, it's usually the bigger they are, the harder they haul. But with the proper preparation, good choice of equipment and a little initiative, over-size hauling can be relatively easy and profitable.

Take, for example, a recent big job in South Chicago. We had to haul 101-ft.-long built-up steel columns through city streets to Indiana Harbor, about 25 miles away.

First job was to inspect the load to determine our equipment needs and route of travel. We went to Bethlehem Steel Company's Chicago Works, where 15 of these steel giants were being fabricated. One look told us that each column would have to be shipped separately. Each unit was really a built-up 30-ton double column. Over-all dimensions were 101 ft. long, 3 ft. wide and 12 ft. deep.

Equipment Needs. The 3-ft. width offered no problem. But the 12-ft. depth meant trouble and so did the 101-ft. length. First of all, we decided to eliminate the pole trailer, which limits us in overhang. Instead we decided to let the steel column act as the trailer bed. Our plan was to fasten one end of the column to the truck-tractor and set a double set of wheels under the other end. That took care of the length worries. Next headache was the load's height. By regulating the size of the bolsters over the wheels and truck-tractor, we could control the height. A bolster too low would cause the tail end of the load to drag along the ground over bumps and on steep grades; too-high would raise the load far enough off the ground but might cause trouble going under viaducts. In this case, we made up a 54-in.-high, 8-ft.-wide bol-



The surface streets were where the battle of the inches took place. Advance tape measuring assured that this turn could be made.

ster. It gave us a 16-in. ground clearance and an over-all load height of 1'34".

Planning the Route. With a tape measure and a set of city street maps in the car, we set out to plot the haul route. We measured viaduct clearances and how far telephone poles were from corners we would turn on; we noted where the lights and stop signs were; we kept the car under 20 mph (the probable truck speed.)

All in all things looked pretty bleak. Pulling out of Bethlehem's fabricating yard and going around the first corner, we would lop off a telephone pole. Going up a couple of steep grades, we would set off sparks as the steel strikes the pavement. It would be really tight going under a couple of viaducts. And to top it off, the estimated time would be about two hours each way; we couldn't move two loads a day without going into over-time.

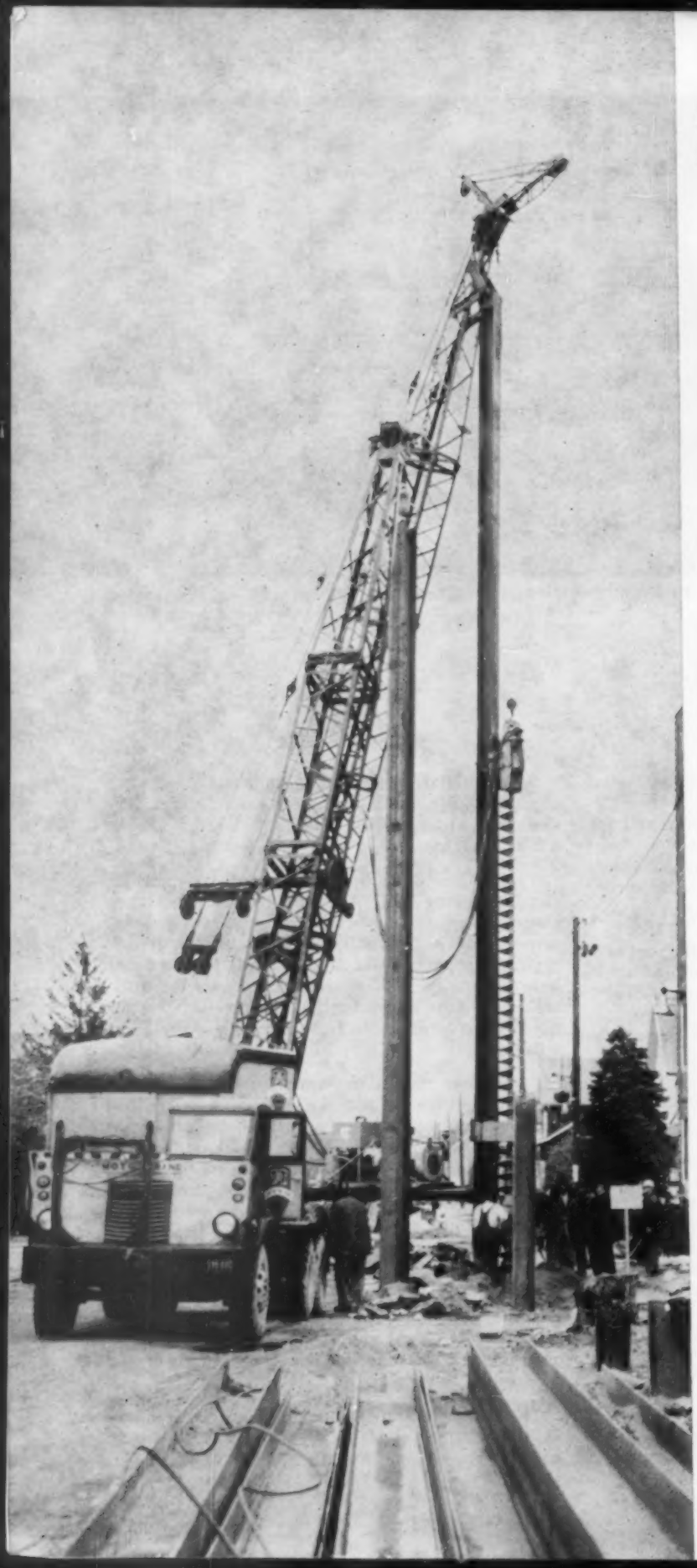
Here's where ingenuity came into play. First we figured out that if we *backed* out of Bethlehem's yard, *backed* along Stewart Avenue, and *backed* out onto 83rd Street, we'd miss the pole by a foot. It was then that one fellow asked, "Why don't we drive straight down 83rd Street and take the Calumet Skyway to Indiana?" The truck driver said he didn't care to mess around the city streets anymore than the next guy, but the Calumet Skyway guards won't let a load like this through. After all, hauling a 101-ft. column is like tipping over an 8-story building and dragging it through traffic. But just because it hadn't been done before, we didn't give up on the expressway idea. I spent a half day down at City Hall—and sure enough, I obtained the necessary permits to haul over the expressway.

We checked out the new haul route and found nothing but relatively wide streets and gentle grades. The shallowest underpass was a full 13'6", which gave us a 2-in. clearance.

Typical Run. Here's how we moved a typical 30-ton, 101-ft.-long load. A 160-hp International truck-tractor towing a double set of wheels, plus two flag cars—a GMC pick-up and my own Pontiac—arrived at the pick-up point about 8 a.m. While the yard men were loading the built-up steel column on the truck, and lashing it down to the bolsters with ratchet binders and turnbuckles, I converted my Pontiac into a flag car.

Changeover took about two minutes. A two-way radio, permitting me to talk to the truck driver, had already been installed permanently in the car. I just flicked the switch to "on." Then I took out a F.B.I. fire ball signal light—a red light with a magnetic base and a 10-ft. extension cord. I stuck the light on the car roof and ran the cord through the vent window to the cigarette lighter, plugged it in, and the light lit up and revolved. Now I was ready to be the lead flag car. The truck followed me and the GMC pick-up, fitted with a permanent dome light, brought up the rear. Each flag car kept from 10 to 500 ft. from the load, depending on speed and traffic. If we didn't watch our distances, someone would cut in between us and the load.

The 25-mile haul took about 55 minutes. Tolls cost $3, round trip, but we made an over-all savings in wages and were able to make two trips a day.



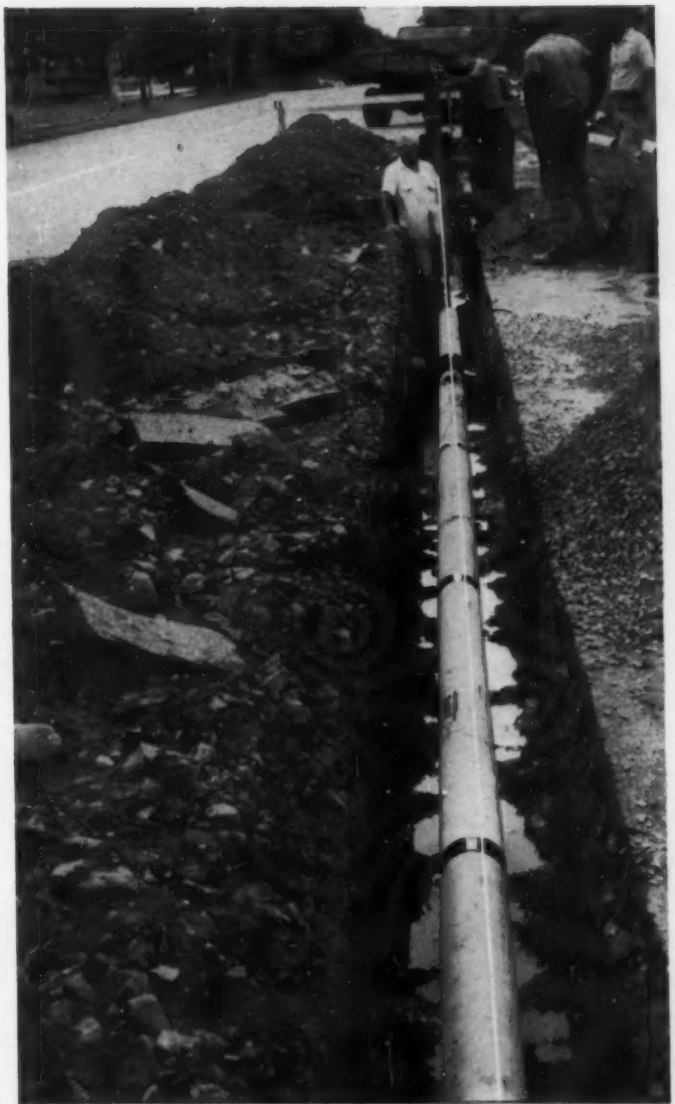
Pile hole boring with Ka-Mo rig and special auger (Trainer) minimized disturbance on this job in the heart of Queens Borough, New York City.

Safer, Quieter: Pile Holes Bored in Built-Up Area

Contractors who have urban highway, street or sewer jobs often face the problem of sinking piles near a hundred apartment windows. For this reason there is wide interest in a method being used on a $5.5 million sewer job in Queens Borough, New York City. T & T Contracting Company of New York City holds this job which calls for a 12,000 ft. double trunk sewer line at average depth of 32 ft. To prevent cave-ins the plans require 2,500 steel soldier H-beams to be driven to a depth of 50 ft. on either side of the central sewer excavation.

The major problem is the fact all this work has to go through built-up residential sections with private homes, apartment houses, schools and churches often within 20 ft. of the H-beams. Thus, if beams were driven by the customary pile driving method, there would be hundreds of claims for cracked walls, cracked foundations, broken glass, etc. Noise was another big complaint with pile driving.

Continued on page 173



NEW!

for subsurface drainage...

TRANSITE UNDERDRAIN PIPE

- **Extremely good weight-strength ratio**
- **Naturally smooth interior**
- **Resists corrosion**
- **Assures low frictional resistance to flow**
- **Excellent alignment, tight joints, low material cost for new installation economies**

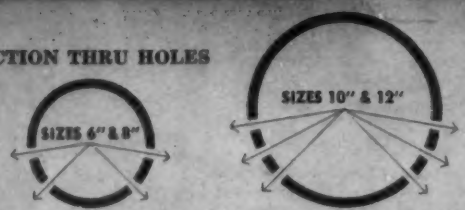
For highways, airports, dams, industrial plant sites—anywhere there's a subsurface drainage job to be done—Johns-Manville Transite® Underdrain Pipe does it effectively and economically.

The plastic coupling used with Transite Underdrain Pipe assures a permanently tight, *flexible* joint . . . keeps out waterborne silt and maintains permanent pipe alignment. And, because of Transite's long (10 ft. and 13 ft.) lengths, fewer joints are needed in the line.

Made of tough, durable asbestos and cement, Transite Underdrain Pipe won't rust. Its interior is made smooth to stay smooth, assisting the flow of water and reducing the opportunity for solids to find a resting place in the line. As a result, the perforations are able to perform their function of permitting entry of ground water into the line , at a maximum rate, where it can be quickly carried off.

Transite's low material cost, installation and maintenance economies mean important savings from the time it is specified until there is no longer a need for the line. Let us send you, without obligation, our book TR-246A. Write Johns-Manville, Box 14 (RS-9), New York 16, N. Y.

SECTION THRU HOLES



The minimum crushing strengths* of Transite Underdrain Pipe for subsurface drainage systems are shown in the following table:

PIPE SIZE (inches)	TOTAL APPLIED LOAD PER LINEAL FT. (pounds)	PIPE LENGTH (feet)
6	1,000	10
8	1,000	10
10	1,100	13
12	1,200	13

*A.S.T.M. 3-edge bearing method
A complete line of fittings is available including elbows, tees, wyes, crosses, end caps and increasers.

JOHNS-MANVILLE

. . . for more details circle 322 on enclosed return postal card

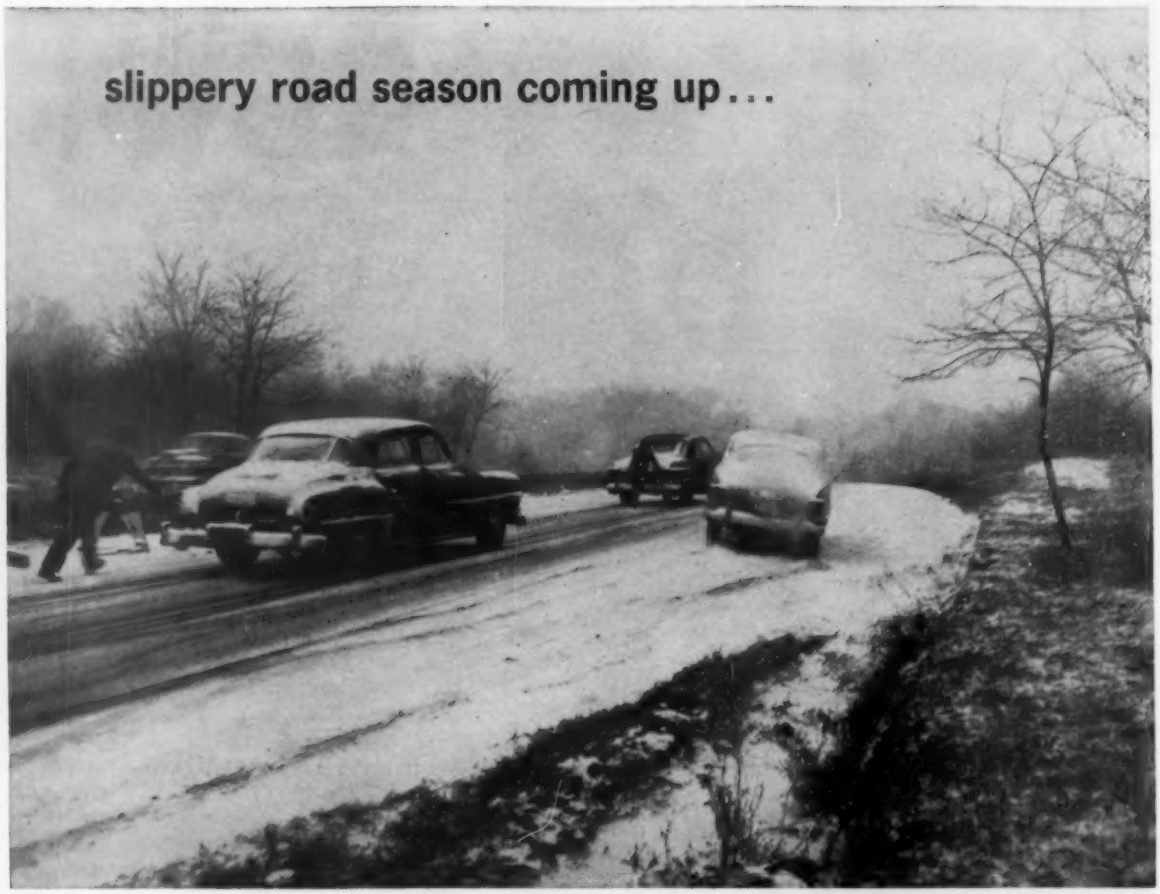


Photo courtesy Bureau of Public Roads, Dept. of Commerce

Icy roads like the one above are quickly changed to safe, bare pavements with Columbia Calcium Chloride–rock salt mixtures.

CLEAR ICY PAVEMENTS FAST

with Columbia Calcium Chloride–rock salt mixtures

No other ice and snow control material offers these Columbia Calcium Chloride–rock salt mixture advantages:

BARE PAVEMENT FASTER: Test results (right) prove the ice melting action of Columbia Calcium Chloride–rock salt mixtures. And, mixtures give you a uniformly clear pavement, free from treacherous patches of ice.

ALL-TEMPERATURE EFFECTIVENESS: Columbia Calcium Chloride–rock salt mixtures assure quick melt at *all* temperatures—from freezing to sub-zero.

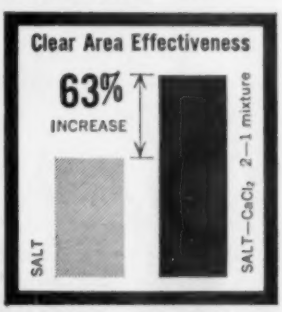
SAVE TIME, MONEY: Columbia Calcium Chloride and rock salt mix easily, can be stored indefinitely, ready for instant use with minimum shelter required. Bulk purchase and storage help stretch maintenance budgets.

Make your winter road plans now in time to get your Columbia Calcium Chloride and rock salt order delivered, mixed and located before winter's first snow fall arrives.

. . . for more details circle 294 on enclosed return postal card

For more information write to our District Sales Office nearest you or to our Pittsburgh Address.

Clear pavement area two hours after application of calcium chloride–rock salt mixtures is 63% greater than salt alone in 25-30° temperature range.
(Based on field studies in Michigan sponsored by the Calcium Chloride Institute)



You'll like doing business with Columbia-Southern

columbia | southern chemicals

COLUMBIA-SOUTHERN CHEMICAL CORPORATION • A Subsidiary of Pittsburgh Plate Glass Co., One Gateway Center, Pittsburgh 22, Pa.
DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas Houston • Pittsburgh • Philadelphia • San Francisco
IN CANADA: Standard Chemical Limited

Showing the high-flight auger which successfully bored through rock strewn ground.

PILE HOLES BORED

Continued from page 170

The contractor therefore decided to drill the holes and drop the H-beams into them. For this purpose the company is using a Ka-Mo drilling rig (by Koehring), comprising 48 ft. of screw flights driven by a 32-hp hydraulic motor. Although the soil involved in the Queens' job is supposed to be mainly sand, the drill rig regularly has encountered rocks, rock heads and boulders; plus chunks of buried concrete and abandoned concrete foundations—all of which would ruin a regular type of drilling head or auger. Being used here is an HT high-spiral 18-in. Trainer PolerBore auger for the actual drilling. A small steel plate is welded to the bottom flight and the top of the auger to obtain a continuous flow.

The auger proved able to work in frozen ground and through all obstructions.

Vincent Saggese, chief engineer for T & T, pointed out several extra advantages of drilling over pile driving for this particular project.

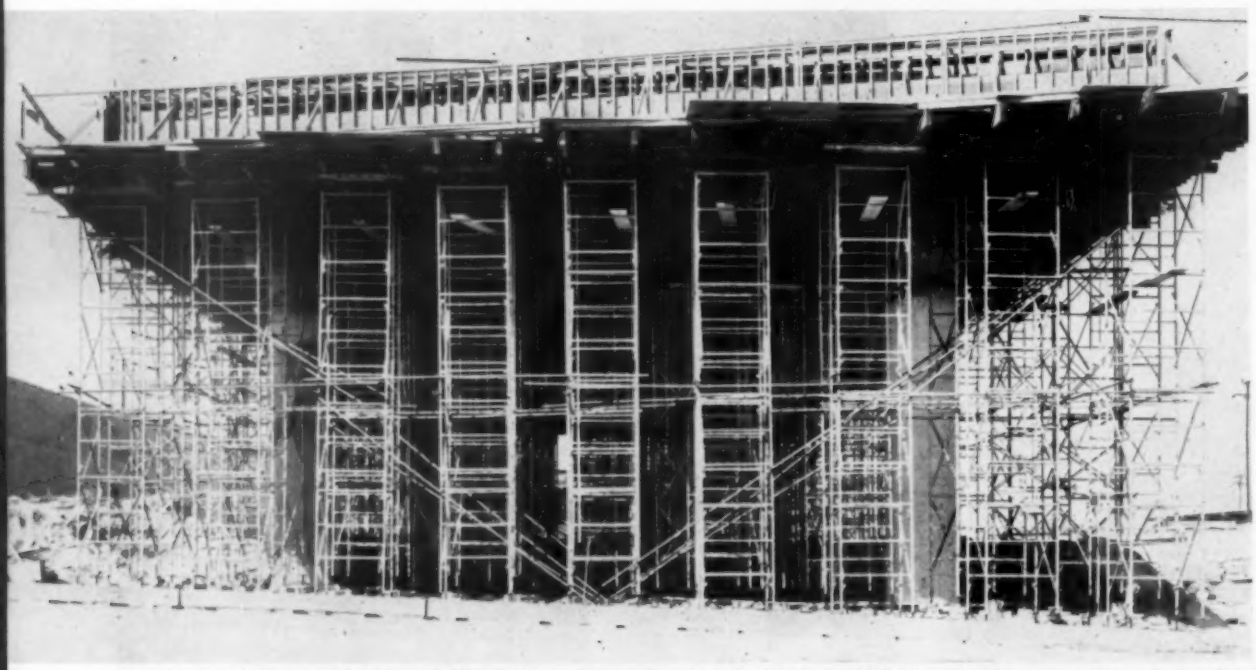
When driving piles it has been hard to miss household sewer lines. The driven pile seals off the line and household sewage starts to back up, leading to possible damage payment. With the drilled holes, a cesspool is formed that took care of this situation until new, permanent connections could be made.

T & T had a problem due to a high-voltage power line line directly over a driving location. The rig when moved to one side found a water main. Another move encountered a trunk sewer. Having no choice, the drillers holed right through the sewer, dropped the H-beam in place, then sealed the holes around the pile. A pile driver would probably have smashed either the water or sewer line.

Weather Forecasting for Cement Users

A unique monthly weather forecasting service for users of cement has been initiated by Alpha Portland Cement Co., Easton, Pennsylvania. Forecasts predict expected temperature, precipitation and specific climatological data. The first specialized service of its type offered in the cement industry, it will supplement Weather Bureau information in the Eastern U.S. for the firm's customers. The service is aimed at helping construction industry people guard against the large losses sometimes caused by the elements.

The information contained in the monthly weather service is supplied Alpha by Weather Trends, Inc., New York, a private firm of meteorologists specializing in long range forecasting.



Soto Street Overpass tubular scaffolding reflecting growing use of this type of shoring on the west coast and elsewhere.

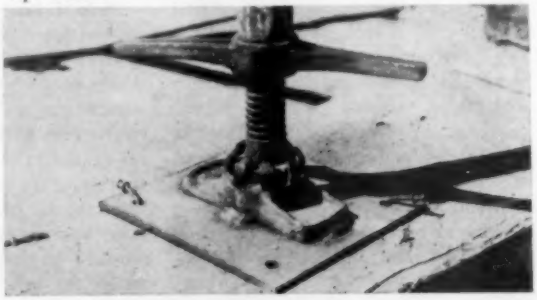
Connectors Spark Scaffold Job

Tubular steel scaffolding towers has stepped up superstructure work for Soto Street Overpass in Los Angeles, part of the new Golden State Freeway. The units here pictured (Jumbo, by Tubular Structures Corporation) were easily set up and dismantled over almost any terrain.

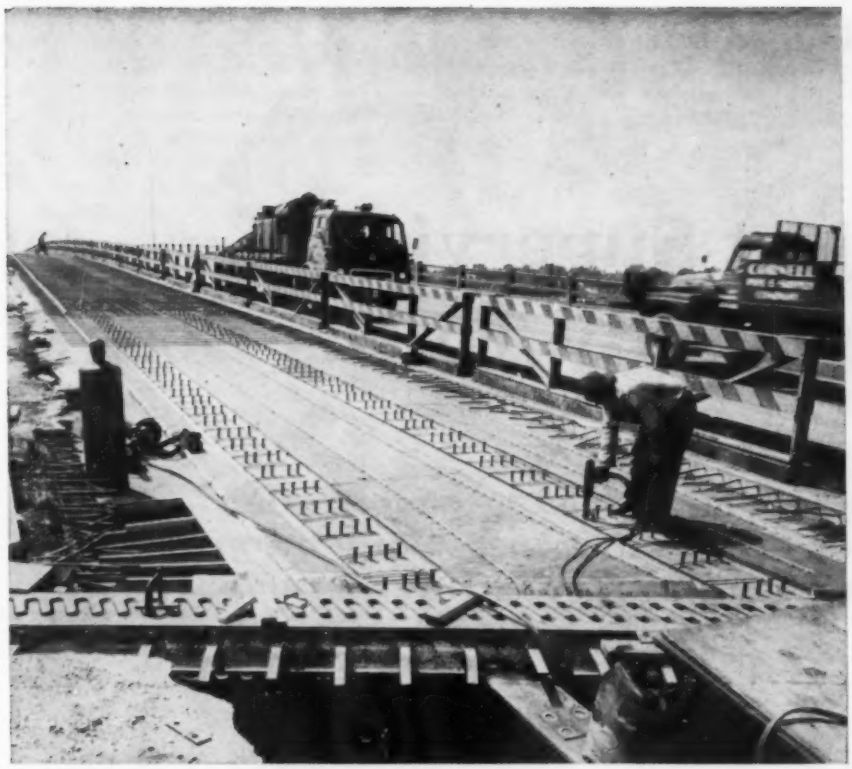
A key to the scheme was Bethlehem's Waco Speedlock snap-on connector and a flexible leveling plate. The connectors used consisted of a ½-in. diam. V-head pins made with C-1012 steel, and a clamp formed of hot rolled strip. The pin's V-head was welded to the scaffolding tube. A diagonal brace with holes in either end fitted over the pin, and the clamp was pushed through the slot in the pin. The result was a rigid box structure that could be built up to any height without bolts, threaded studs or special tools.

The adjustable leveling plate consisted of a 1½-in. dia. round with continuous modified acme thread to 19 in. above the head. The head was rounded and fits into a socket welded to the steel base plate.

Since the rounded head allowed positive placement at any angle, the plate could be set up on nearly any ground configuration with little need for soil compaction. When used at the top of the scaffold frames, the flexible base plates fit easily into sloped surfaces encountered on banked turns.



(Top) flexible leveling plate used to simplify the scaffolding setup and removal, and (Bottom). Snap-on Speedlock.



(Left): Showing shear connectors being placed, and forms in position for the new deck slab. Traffic maintained on one-half the roadway. (Right): Among the reasons chosen for using end-welded studs as shear connectors was the ease of placing reinforcing bars.

New Composite Deck Upgrades Old Bridge

A bridge deck that needed replacement in Illinois was recently rebuilt to a composite (shear connected) design, adding to the load capacity at little extra cost to taxpayers. The 1,500-foot Burr Oak Avenue Viaduct in Blue Island, Illinois was upgraded from an AASHO load rating of H18-S15 to the equivalent of H-20-S16.

The prime reason for the reconstruction was the deterioration of the 7-in.-thick roadway slab. Undesirable vibration and live load deflection were also factors in deciding to rebuild. Steelwork was considered structurally adequate. By bonding the new concrete slab to the steel beams, vibration and deflection could be considerably reduced.

Since the concrete had to be replaced, composite construction was considered the most economical method of stiffening the structure. According to a spokesman in the Illinois Division of Highways bridge staff, had the deck replacement been unnecessary, upgrading by welding cover plates to the bottom beam flanges would have been economical. Cover plates would have increased steel stiffness but might not have reduced vibration as much as composite construction. Under the circumstances, no cover plates were used.

Nelson headed shear connector studs of 4" x 7/8" size were used in the composite design because of their speed application. This type connector eliminates warpage in the structural members sometimes encountered when prolonged arc time is required in the fillet welding of structural shapes or other type connectors. The studs also simplified installation of shear connectors near rivet heads on the plate girder spans.

A total of 24,160 of these studs were end-welded to the upper flanges of the bridge girders with a Nelson NS-9 stud welding gun using a Nelwelder 2,000 power source. They were installed about three per minute, welding four in a row with rows 6 in. to 18 in. apart.

Traffic was maintained on one-half of the bridge, while the other half was being rebuilt. The general contractor was the States Improvement Company, Maywood, Illinois.

A Project Supervisor's Responsibility To His Boss

In road contracting the big payoff often depends on "little differences" in job control. Two successful contractors offer specifics.

In a previous article a summary report was made by Professor Emmett H. Karrer of the Ohio State University on a series of short courses for contractors' supervisors which have been developed and conducted by the Department of Civil Engineering of Ohio State in cooperation with the Ohio Contractors Association.

In the belief that some of the specific subjects of these short courses would be of interest to other contractors, there is recorded here a summary of the remarks by two outstanding Ohio contractors. These leaders talked on the subject of "Responsibility of a Supervisor to the Contractor." The two contractors who separately handled this subject on different sessions of the school were Vern N. Holderman of the V. N. Holderman & Sons Company of Columbus, and Glen W. Maxon of the Maxon Construction Company, of Dayton.

The principle theme of these two speakers was that the contractor must grant clear-cut authority to his supervisors, and that with this authority the supervisors have a responsibility to the contractor. Supervisors are generally picked with two thoughts in mind. (1): What does the man know about problems peculiar to the task of supervising construction? and (2): How will he regard and use the authority placed in his hands?

With the keen competition among contractors for projects today, the margin of profit has been shaved very thin. In order to stay in business, however, the contractor must make a profit.

Baseball fans realize that while the ordinary ball player receives a salary of from $15-20,000 per year, the star player may be paid as much as $75-100,000 per year. If you look closely, however, you will see that there really is not a great deal of difference between the demonstrated abilities of the two players. The ordinary player bats perhaps 250, that is, he makes 5 hits in 20 times at bat. The star player may be batting 300, or making 6 hits in 20 times at bat. Just this one more hit in each 20 times at bat makes the difference between the ordinary and the star player. And in the construction business there isn't really much difference between the guy who is losing his shirt and the guy who is making a 5 percent profit. That little difference—that little extra effort—that little extra knowledge, is the big payoff. Such things as the diligent application of some of the items learned by supervisors in a short course, can make the big difference for the supervisor and for his company.

The prime responsibility of the project supervisor to the contractor is that of job management. Authority granted to the supervisor might be broken down into six categories. These are:

1. Job Planning—Deciding when, where, by whom, and how each item of work is to be done.

2. Personnel—Managing the payroll, selecting, coordinating, and directing employees.

3. Management of Equipment—Seeing to it that the equipment is utilized, maintained, and coordinated.

4. Management of Materials—Seeing that materials to be consumed on the job are available when needed and are handled as little as possible.

5. Records and Reports—Keeping the contractor properly informed of job conditions and progress.

6. Public Relations—Creating for the contractor a good reputation with employees, with the State and with the public.

Several specific duties can be listed under each of the above categories. Some of these specific duties are as follows:

Job Planning

Be thoroughly familiar with the

plans, specifications, and general provisions of the contract.

Arrange for necessary plans and supplemental diagrams to be distributed to assistant superintendents in charge of the various operations. These should include:

Quantity diagram
Pipe diagram
Paving diagram

Advise public utilities in advance of operations in areas where they are involved.

Arrange for borrow pits well in advance of time they will be needed.

Arrange for necessary drainage structures to be installed so as not to delay earthmoving operations.

Keep engineering forces advised of your plans so no delay will occur from lack of stakes.

Be conscious of completion date with respect to progress.

Be observing of any way to cut cost for contractor.

Arrange for and coordinate delivery of all materials.

Prevent delay in progress.
Control excess inventory.
Arrange for testing well in advance of your needs.

Personnel

Obtain capable people. Look for men with good physical qualifications, initiative, integrity, training, and knowledge.

Instruct assistants in reading plans and diagrams.

Keep assistants informed in advance as to the sequence of planned operations.

See that assistants understand the policies of the contractor.

Through your leadership bring about the interest, enthusiasm, and willing participation of your assistants.

Supervise, follow up, and judge performance of assistants.

Follow up instructions to assistants—see that they are enforced.

Eliminate personnel whose actions may discredit contractor's public relations.

Recognize the unusual capabilities of your men with an eye toward advancement.

Observe applicable laws involving hiring or interviewing job applicants.

Keep your men safety conscious.

Equipment Management

Be aware of the equipment needs to effectively, efficiently, and economically perform the job.

See that equipment assigned to the job is used efficiently.

Keep headquarters informed in advance of machines for which you anticipate no further use.

See that equipment is kept in good repair and properly maintained.

Management of Materials

Check with headquarters to make sure that all materials have been ordered to be delivered at the time and at the exact place needed on the job.

Keep storage and rehandling of materials to a minimum.

Make sure that materials which are to be tested have been sampled and tested by the owner in ample time before usage.

Be ready for materials when they are delivered. Clean areas for aggregate, sheds for perishable materials, etc.

Records and Reports

See that you as a superintendent and your assistants keep all records and reports required by the contractor.

Field progress reports.
Accurate time cards.
Accident reports.
Purchase orders.
Job diary.

Maintain accurate records on materials used.

Prevent waste.
Check overrun and underrun.

See that all agreements and subcontracts made by the contractor are carried out.

Borrow pit agreements.
Suppliers deliver on schedule.

Be job wise and cost conscious—study all records and reports made available.

Have available weather reports.
Observe cost reports from contractor.

Honor confidential information so that it cannot be misused within or outside your organization.

Public Relations

Cooperate with people within the organization, including:

Contractor himself.
Your assistants.
Preventive maintenance personnel.

Cooperate with owner. (As State Highway Department)

Keep project engineer advised in advance of your daily plans.

Cooperate with traveling public.

See that flagmen show courtesy to traveling public.

Cooperate with landowners adjacent to your project.

Cooperate with representatives of newspapers.

Cooperate with utilities representatives.

The success of the supervisor, as an individual, will depend to a considerable extent on the success of the contracting firm for whom he works. The supervisor should keep in mind the importance of seeing to it that the contractor is successful. Education is a continuing process and the smart supervisor will ever strive to learn more about his job, and to pass on his knowledge to those working under him.

George M. Foster Heads Highways Foundation

George M. Foster, former chief deputy commissioner of the Michigan state highway department and recently head of the Indiana highway department, has been appointed as full-time executive director of the Better Highways Information Foundation. The Foundation, composed of groups interested in road building and highway users, was recently organized to carry on a public relations drive to acquaint the public with the need for better roads.

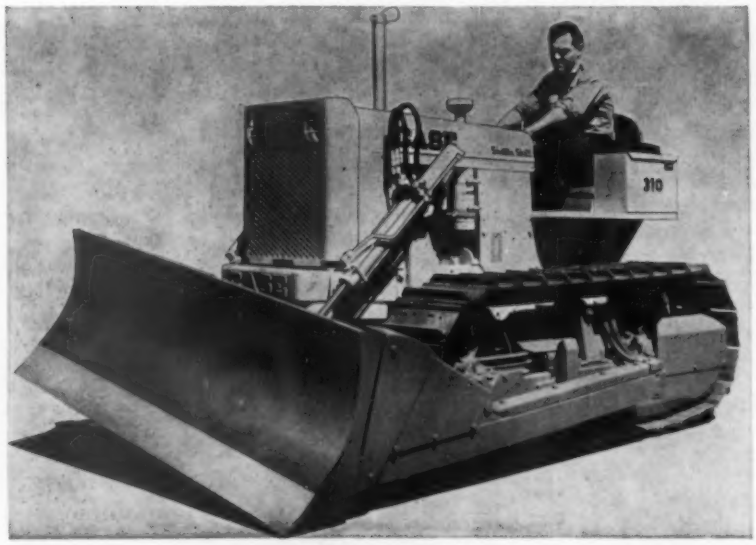
Foster will make his headquarters in Washington, D. C., as soon as he completes his duties in Indiana.

H. D. Anderson, a past president of Associated Equipment Distributors, has been appointed vice chairman of the Foundation, it was also announced.

Foster has had nearly 40 years of experience in highway matters. He began with the Michigan department in 1922, becoming bridge engineer and for six years serving as deputy commissioner. For the past three years he has headed the Indiana state highway department. He has served as an officer in a variety of highway organizations at national and state levels.

NEW PRODUCTS

Listed here are reviews of new and improved equipment items, selected to aid our readers in purchasing. See reader service numbers on enclosed postcard.*



Power to Tilt Blade

Power Angle Power Tilt Dozers

New dozer units with power-angling or power-tilt blades are being offered mounted on the 42 hp. Model 310 Utility crawlers, according to an announcement by J. I. Case Co.

The Power-Angling dozer allows operator to angle the blade to 25 deg. left or right without having to stop the tractor and wrestle the blade into the correct position. The blade can be reversed when side casting makes turn-arounds necessary after a long run.

The Hydraulic tilt-dozer is designed for road crowning, ditching or maintaining level grades in rough terrain. The blade will tilt to either side while the tractor is in motion. The blade tilt is effected via a hydraulic lever on the dash of the tractor.

Either of the blades are available on the Case 310, a utility tractor that will develop 29 drawbar hp. and deliver up to 5815 lbs. pull or push. It is powered by a 4 cylinder Case engine and a shuttle-shift transmission.

J. I. Case Co., Racine, Wis.

For more details circle 101 on Enclosed Return Postal Card.

Twin-Power Scraper

A new twin-power 14 cu. yd. struck capacity scraper with all wheel drive has been announced by Euclid.

Called the TS-14, the new rig is powered by two GM 4-71 engines, each with a separate Allison Torqmatic Drive consisting of torque converter and 4 speed semi-automatic transmission. The total hp. is 296. The operator can change from one speed range to another by a power shift selector lever. All scraper operations are hydraulically and independently controlled. Cutting edge consists of 4 sections that are identical and reversible and each is adjustable to provide the most efficient loading. Descriptive literature is also available from the manufacturer.

Euclid Div., General Motors Corp., Cleveland 17, Ohio.

For more details circle 102 on Enclosed Return Postal Card.

Cleaner Cooling Systems

A new de-scaler for use in cleaning diesel cooling systems and radiators was announced by Dearborn Chemical Co.

The product, known as Scale-Cleen, is made with sulfamic acid and inhibitors that allow the acid to clean and dissolve scale without corroding or damaging the metal. The manufacturer says there are no irritating fumes and the product is non-irritating to the skin.

Distributor Sales Div., Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.

For more details circle 103 on Enclosed Return Postal Card.

Concrete Meter

A new device that will measure the amount of concrete in a truck has been announced by Concrete Transport Mixer Co. The device is said to take the guesswork out of pouring more than one load of concrete by measuring the amount of each pour, up to 3 yds. The meter comes in kit form.

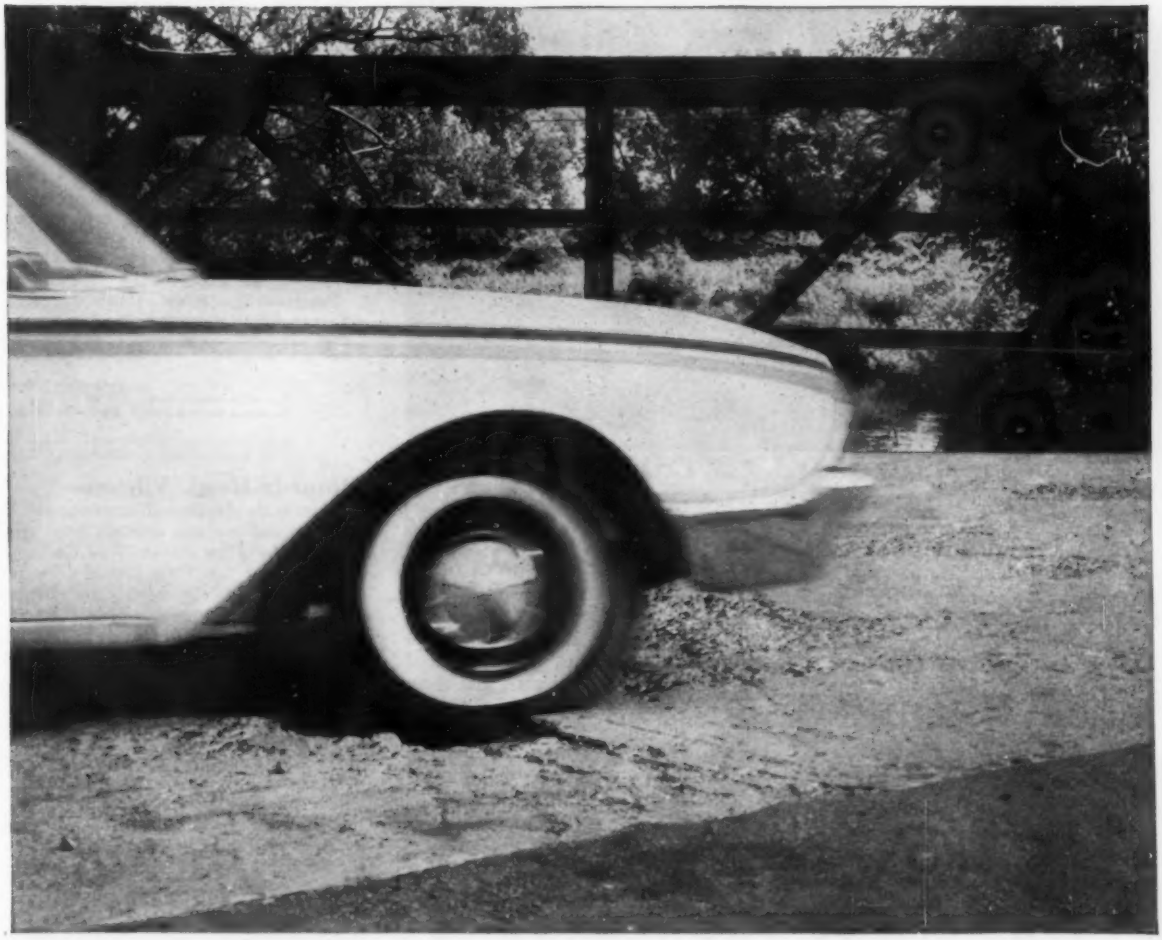
Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 39, Mo.

For more details circle 104 on Enclosed Return Postal Card.

Twin-Powered Scraper

*To readers outside of the United States—postal rules forbid use of business reply cards outside of the U.S. Please write to us listing the numbers, month and name of magazine, and mail with your name and address to Inquiry Dept., Roads and Streets, 22 W. Maple St., Chicago 10, Ill., U.S.A.

DOW | MATERIALS FOR MAINTENANCE



FIGHT TRAFFIC AND FREEZE-THAW DAMAGE

...patch bridge decks with latex modified mortar

From patching dangerous chuckholes to resurfacing an entire bridge deck, you'll get durability far superior to conventional patching materials using portland cement mortar modified with Dow Latex 560!

Latex modified mortar resists water absorption damage . . . provides greater resilience, tensile and bond strengths . . . forms a layer that conforms to the expansion-contraction cycle of the original concrete, reducing stress on the new surface.

In patching chuckholes, latex modified portland cement mortar can be applied directly to the damaged area. The only requirement is that the concrete itself be sound, and the surface free from dust, dirt, grease and loose material.

Where a section of the road surface is badly spalled, only the areas of actual damage need be jack hammered to expose a sound concrete base. A minimum of ½ inch of latex modified mortar is sufficient to give bond and strength. Compare the savings in time, materials, and labor costs against the 4- to 6-inch thicknesses required with conventional resurfacing!

For full information on how you can start testing mortar modified with Dow Latex on structural concrete bridges, or highways, write for a technical report. Address: THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1957EK9.

See "The Dow Hour of Great Mysteries" on TV.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

. . . for more details circle 299 on enclosed return postal card

Self-Propelled Compaction Unit

Rollers and Compactors

A new line of heavy construction equipment in the compaction line has been announced by the newly formed Thunderbird Engineering Co. of Tulsa.

The new line will include self-propelled pneumatic rollers up to 34 tons, pull type pneumatic rollers, 50 ton pneumatic compactors, sheepsfoot rollers and the Crusher-Pak grizzly roller.

The pneumatic rollers feature contact pressures in excess of 80 psi. The larger models are equipped with an individual vertically oscillating wheel mounting both front and rear and individual differential for every drive wheel to permit tight turns without scuffing.

A basket-type roller, the Crusher-Pak, will crush and pack as it rolls. The manufacturer reports that it is ideal for salvaging old bituminous roads.

Thunderbird Engineering, Inc., 2811 Dawson Rd., P. O. Box 8536, Tulsa 10, Okla.

For more details circle 105 on Enclosed Return Postal Card.

Earth Moving

A complete hauling unit, designed and engineered for large earth moving projects, has been announced by Challenge-Cook Bros., Inc.

Designated the C-B Earthking, the new machine uses new combinations of construction machinery that work towards greater speed and less equipment investment. It is reported to haul as much as 45 tons of payloads over off-highway construction roads at speeds up to 52 mph. The air-actuated bottom dump is operated by the driver from inside the cab. The earth-mover is reputed to be capable of dumping on the move in less than 12 sec., offering a cut-down in cycle time. The unit is also capable of hauling full legal payloads over the highway.

Challenge-Cook Bros., Inc., Dept. 13, 3334 San Fernando Rd., Los Angeles 65, Calif.

For more details circle 106 on Enclosed Return Postal Card.

Mercury Lighting

A light-weight ballast unit that converts any NEMA-standard incandescent fixture to mercury in a short time, was announced recently by Precision Multiple Controls, Inc.

Trademarked as the Convertalume, the new aid was announced to weigh only 14 lbs. It is made of aluminum to match standard fixtures and is offered in standard and high power factor in 100, 175, 250 and 400 watt capacities. Conversion is accomplished by inserting the new unit in any locking type receptacle designed to NEMA standards. The control is then re-inserted in the receptacle on the top of the ballast unit and a mercury lamp is inserted in the incandescent socket. First deliveries are expected in September.

Precision Multiple Controls, Inc., 233 Chestut St., Ridgewood, N. J.

For more details circle 107 on Enclosed Return Postal Card.

Motor-In-Head Vibrator

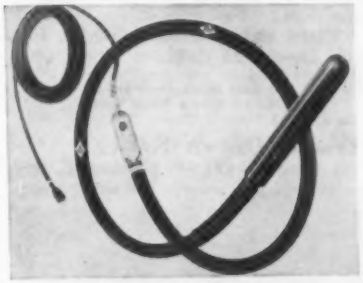
A recently developed motor-in-head concrete vibrator has recently been announced by Thor Power Tool Co.

Designated the Thor Model CV3, it was designed to be used on 115-volt alternating current and will operate at room temperatures for 20 min. before thermal protection functions, reports the manufacturer. By imbedding the thermal control in the motor windings, Thor claims exact protection in the new vibrator to eliminate motor burnouts. The motor is said to stop when overheated and re-start automatically when it cools. Heat protection within the vibrator portion of the head is achieved through the use of self-pumping oil bath. A neoprene seal prevents seepage of this oil from the vibrator compartment to the motor compartment.

The unit will deliver 15,000 rpm.

The C-B Earthking—45 Ton Payload at 52 mph.

New Products



Heat-Resistant Vibrator

and is available with 10 or 20 ft. long flexible hose. Attached to the end of the hose is 25 ft. of three-conductor heavy duty rubber covered cable with three-prong grounding type male plug. The head weighs 15½ lbs.

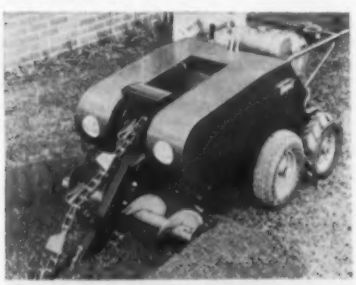
Thor Power Tool Co., 175 N. State St., Aurora, Ill.

For more details circle 108 on Enclosed Return Postal Card.

Compact Trencher

A big self-propelled trencher in a small package is the way Auburn Machine Works describe their new machine.

Titled the Auburn Compact, the single unit body is constructed of heavy steel plate and reinforced and electrically welded. The four-wheel drive in both forward and reverse is powered by a hydraulic drive that automatically

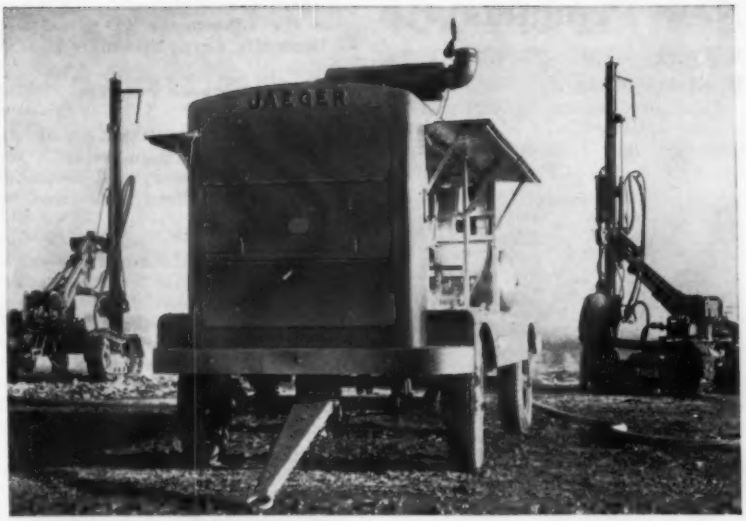


Compact Trencher

gives maximum trenching speeds under varying soil conditions. The digging boom can be lifted hydraulically through a 186 deg. arc. The device is equipped with transport wheels which raise and lower hydraulically and a retractable draw bar. The 9 hp. Wisconsin engine, coupled with a blade that will cut 3 in. to 6 in. wide and 5 ft. deep allow speeds of up to 500 ft. per hr. Descriptive literature is also available.

Auburn Machine Works, Auburn, Neb.

For more details circle 109 on Enclosed Return Postal Card.



Maintains 100 psig behind two Thor TR-5 air-and-hydraulic crawlers with 4½" drifters without running faster than 1400 rpm.

JAEGER "900" is the efficient rotary

Delivers in excess of 900 cfm at a fuel-saving, engine-saving 1700 rpm. Other compressors, using the same GM 6-110 diesel, require 1800. See your Jaeger distributor, or send for catalog.

THE JAEGER MACHINE CO., 223 Dublin Ave., Columbus 16, Ohio

. . . for more details circle 323 on enclosed return postal card

Jay Tamper maintenance: "2 years - $17"

The Roy Klossner Company, San Antonio, Texas, sells Jay Tampers to such blue ribbon contractors as the Bechtel Corporation, which used 7 of them on the Reynolds Aluminum project near Gregory, Texas.

Reports Klossner: "The first 50 Jay Tampers we sold averaged $17 for replacement parts over a 2-year period. Double that to count labor, and maintenance still figures out at less than 4c per hour."

Savings on such jobs as the Port Charlotte Residential Development and the Tidewater Refinery are similar. In one case, compaction cost per cubic yard was cut from $2.68 to 12c.

Even greater savings are now available with Jay's new models, which tamp harder, faster, better on all soils and blacktop. Improvements include stepped-up power, new handles, and a new trailer for easy transport.

See your Jay dealer for a free demonstration, or send for new Catalog J-0. Jay Company, Division of J. Leukart Machine Co., Inc., 2228 South Third Street, Columbus 7, Ohio.

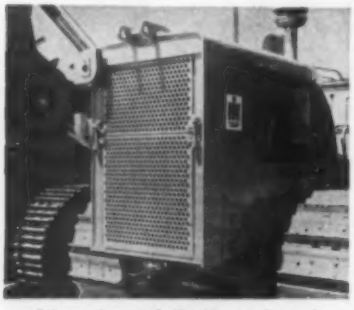
JAY tampers

. . . for more details circle 327 on enclosed return postal card

New Products

Wrap-Around Radiator Guards

A new, heavy-duty, one-piece, wrap-around radiator guard affording protection to the radiator core, front-mounted pumps and cable controls



Wrap-Around Radiator Guard

now is available for International TD-20 and TD-15 crawler tractors, it was announced.

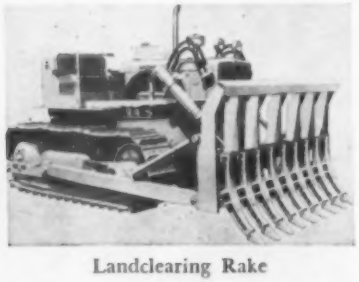
The heavy-duty outside plate, formed from ⅝ inch steel plate, adds strength to the front of the tractor. A convenient feature of the guards is the swing-out, access door, which permits easy cleaning of the radiator core. A dowelling arrangement makes for ease of assembly. On tractors equipped with hydraulic blades, the guards offer hydraulic tank and pump-mounting arrangement. The lower hydraulic tank has 100 per cent full-flow filter at the base of the guard.

International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.

For more details circle 110 on Enclosed Return Postal Card.

Landclearing Rake

Available for cable or hydraulic operations, bull-dozing or angle-dozing, the new landclearing rake by Drott Mfg. Corp. is reported to move trees, stumps, rocks and boulders, and still leave the immediate dirt in position.



Landclearing Rake

The rake features teeth cast of Manganese Molybedenum steel. Teeth are individually mounted and can be adjusted to suit the specifications of the job. On the bull-dozer line, tooth pitch can be adjusted for uprooting stumps or raking action. Widths range from 95 in. on the TD-9 to 151 in. on the TD-25. The attachment is available for all International Harvester tractors from the TD-9 to the TD-25.

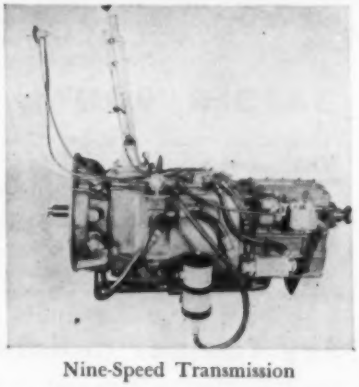
Drott Mfg. Corp., Milwaukee 15, Wis.

For more details circle 111 on Enclosed Return Postal Card.

Nine-Speed Transmission

A new nine-speed transmission for heavy-duty off-highway and industrial applications has been announced by Fuller Mfg. Co.

Providing nine closely-spaced forward gear ratios selected with a single shift lever, the device features pressurized jet spray lubrication for the mainshaft pilot bearing of the front section as well as bushings of the mainshaft mounted gears, a countershaft inertia brake which makes quick upshifts possible without doubleclutching, and an inhibitor which prevents the operator from ingaging gears in the front section until the automatic shift in the



Nine-Speed Transmission

anxiliary is completed. Tow power take-off openings are provided on the R-1750, as it is called, one on each side of the transmission.

Fuller Mfg. Co., Transmission Div., Kalamazoo, Mich.

For more details circle 112 on Enclosed Return Postal Card.

Tandem Roller

A new roller equipped with automotive type steering and a foot operated automotive type service and parking brakes was announced by Essick Mfg. Co.

The 3 ton roller, the 320, is said to have a lower center of gravity and wide rolls to ensure stability and safety on slopes. The constant mess transmission with ready accessible clutches and heavy duty roller chain and sprockets are reported to save on maintenance.

3 Ton Tandem Roller

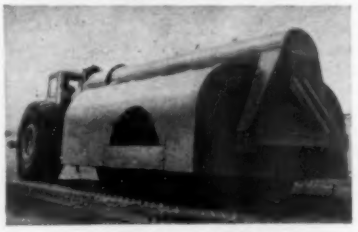
All Essick tandem rollers have their own custom engineered trailer, designed for loading and unloading by one man.

Essick Mfg. Co., 1950 Santa Fe. Ave., Los Angeles 21, Calif.

For more details circle 113 on Enclosed Return Postal Card.

Tractor-Drawn Roller

A tractor-drawn pneumatic tired roller that has 100,000 lbs. on the tires



Tractor-Drawn Roller

and 15,000 lbs. on the tractor was announced by Koehring Co. of Calif.

Reputed to roll down a course at speeds of 10 mph., the new Ko-Cal Konsolidator, as it is known, weighs 37,000 lbs. empty. The body has 700 cu. ft. of space for water ballast. The new roller is about 29 ft. long, 12 ft. wide and 10 ft. high.

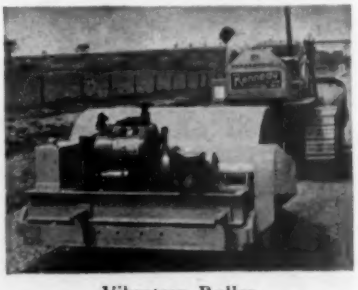
Koehring California Co., 2200 Country Club Blvd., P. O. Box 1891, Stockton 4, Calif.

For more details circle 114 on Enclosed Return Postal Card.

Vibrating Roller

A new tractor-drawn vibrating roller being produced by Western Equipment Div. of Douglas Motors was recently announced.

Powered by a 32 hp. air cooled gasoline engine, the Model 4T is equipped with 12 volt battery, electric starter, generator and 35 gal. fuel tank. The 8000 lb. rig develops 1600 vibrations per min. and will produce compaction forces equivalent to a 20 ton dead weight roller, states the manu-



Vibratory Roller

facturer. The 4T is recommended by the manufacturer for granular base material, soil stabilization, crushed stone, and sand work.

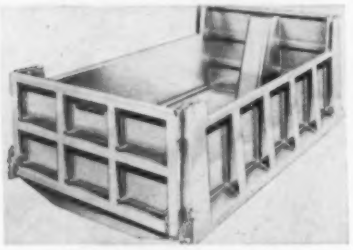
Western Equipment Div., Douglas Motors Corp., 1234 N. 62nd St., Milwaukee 13, Wis.

For more details circle 115 on Enclosed Return Postal Card.

Aluminum Dump Bodies

A new light weight aluminum dump body that permits the hauling of optimum legal payloads utilizing rugged construction features has been announced by Hercules Steel Products Co.

Designed for tandem axle chassis in the 30,000 to 65,000 lb. gvw. range, the



Aluminum Dump Bodies

new Model LA-20V dump bodies have hoist well housings to accommodate weight-saving front-mounted telescopic hoist. The bodies are available in 12 to 18 ft lengths and are a standard 84 in. inside width. Literature is available from the manufacturer.

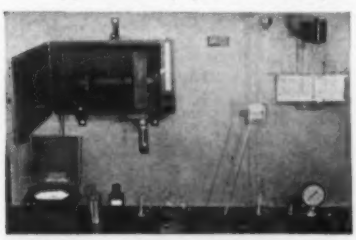
Hercules Steel Products Co., Galion, Ohio.

For more details circle 116 on Enclosed Return Postal Card.

Compact Wagner Turbidimeter

Designed as a compact new easy-to-use model of the Wagner Turbidimeter, a new device announced by Soiltest, Inc., includes all the apparatus needed to determine the fineness of Portland cement.

Reported to conform to the specifications set down by the American Society of Testing Materials and the American Association of State Highway Officials, the apparatus consists of a source of light constant intensity, adjusted so that approximately parallel rays pass



Compact Wagner Tubidimeter

through a suspension of sample cement and impinge upon the sensitive plate of a photoelectric cell. The current generated by the cell is measured with a micrometer and the indicated reading gives a measure of the suspended cement's turbidity.

Soiltest, Inc., 4711 W. North Avenue, Chicago 39, Ill.

For more details circle 117 on Enclosed Return Postal Card.

Four-Wheeled Tilt Bed Trailer

A four-wheeled tilt bed trailer has recently been released for production by International Harvester.

The International No. 41 is designed as a versatile high-speed highway trailer for moving equipment and has a rated capacity of 10,000 lbs. when equipped with 8.00x14.5 in., 12 ply tires.

Each wheel is set on an independent axle imbedded between four rubber cushions. The cushions give each wheel independent knee action and eliminate the need for springs, shackles or bolts and shock absorbers, states the manufacturer. Lubrication with that arrangement is unnecessary. The effect is said to be very like an auto torsion bar and

Tilt-Bed Trailer

gives a "car-like" ride. The No. 41 is supplied with hydraulic cylinder to give positive tilting and eliminate platform slam.

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

For more details circle 118 on Enclosed Return Postal Card.

Trailer Body

A new trailer body, utilizing one-inch "V" corrugations and designed for maximum legal payload has been introduced by the Galion Allsteel Body Co.

According to the manufacturer the new body design, called the XL, is engineered to provide the greatest strength

Trailer Body

per lb. of weight. When combined with the light-weight formed rail chassis and front-mounted telescopic hoists, it gives the lightest possible steel unit consistant with good design. The units are available in standard lengths of 16 to 28 ft. with a capacity range of 10 to 35 cu. yds. The new body is said to be adaptable to any axles depending on state laws.

Galion Allsteel Body Co., Galion, Ohio.

For more details circle 119 on Enclosed Return Postal Card.

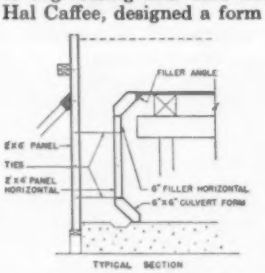
492 Ft. Culvert

Symons Prefab Forms and Engineering Service

. . . Reduced by About ½ Material Needed for Job

How to extend an existing culvert 492 feet to allow Mercer Slough to pass under the new Seattle by-pass of U.S. Highway 99. Also, how to finish it before rains swell the slough, or creek, to over-flowing. That was the problem faced by A. R. Anderson Construction Company, Seattle.

Anderson used Symons Culvert Forms with Symons Steel-Ply Panels. Symons engineering and their Seattle man, Hal Caffee, designed a form lay-



out, so that inside wall and fillet forms could be stripped out without disturbing the shoring for the slab roof. This not only saved time but reduced by almost one-half, the material needed for the job.

The pay-off! It is estimated that it took under 200 man hours to set up and pour the job and under 60 man hours to strip the forms.

For the complete story on the *Seattle Culvert Job*, send in request on your company letterhead. Symons Steel-Ply Forms rented with purchase option.

Symons

SYMONS CLAMP & MFG. CO.

4283 Diversey Ave., Dept. J-O, Chicago 39, Ill.

Warehouses Thruout the U.S.A.

MORE **SAVINGS** FROM **SYMONS**

. . . for more details circle 343 on enclosed return postal card

New Products

Safety Block

A new safety block that is said to engage a locking device that will stop the rope in about one ft. has been announced by Machinery Center Inc.

With normal movement the rope pulls out and winds up automatically, keeping the rope taut and giving the

Safety Block

user freedom of movement with absolute safety. Because of a friction brake on the rope drum in the block there is no jolt on the man in case of a fall. A manual control allows stopping at any point. The device holds 16 ft. of steel wire rope mounted on a spring loaded drum.

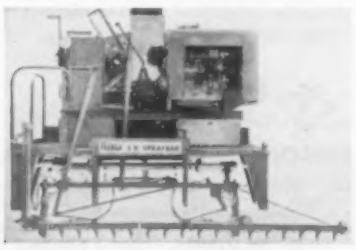
Advance Product Marketing, Inc., 1201 S. 6th West, Salt Lake City 1, Utah.

For more details circle 120 on Enclosed Return Postal Card.

Bituminous Spraybar

A new type of spraybar for their bituminous distributors has been announced by Rosco Mfg. Co.

The new product features instant start and stop, no-drip shut-off, instant reverse suction and improved safety break-away. Enlarged passages within the sump provide ample feed to the spraybar. The manufacturer has attempted to minimize the number of parts to provide easier cleaning. Each nozzle on the EK, as it is entitled, has its own individual valve mounted underneath the bar. The valves do not extend up into the bar, thus leaving the exterior of the bar unobstructed.



Bituminous Spraybar

Rosco Mfg. Co., 3128 Snelling Ave., Minneapolis 6, Minn.

For more details circle 121 on Enclosed Return Postal Card.

Field Crew Water Cooler

A new water container, available in two, three, five and ten gal. sizes, that will handle either hot or cold beverages, has been announced by H. P. Gott Mfg. Co.

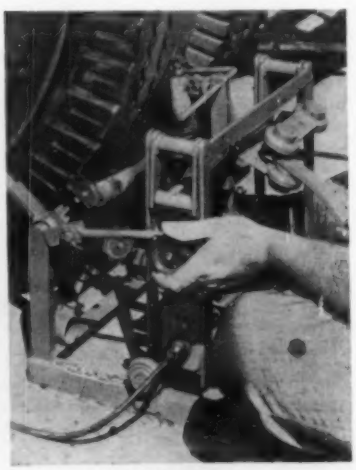
Called the Gotkool, the new cooler is insulated with urethane foam and has a plastic liner. Nylon faucets eliminate metal contact for contents and aid in insulation, since, it is reported, they do not permit heat transfer. The faucets are recessed into the side of the can to avoid damage in rough use.

H. P. Gott Mfg. Co., P. O. Box 702, Winfield, Kansas

For more details circle 122 on Enclosed Return Postal Card.

Tire Regroover

A new device that can regroove a rubber tire with a heated blade has been announced by Honeycutt Tool Mfg. Co.



Tire Regroover

The unit is portable and can be operated by one man. The regroove is said to use the rubber that is wasted when a tire is buffed down in preparation for recapping. The advantage, the manufacturer emphasizes, is that the regrooving can be accomplished without removing the tire from the truck.

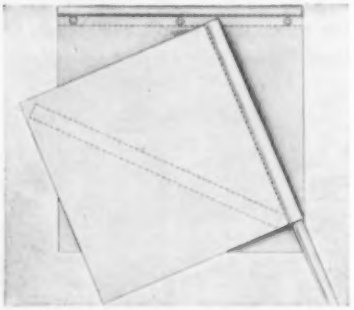
Honeycutt Tool Mfg. Co., 315 Austin St., Houston 2, Texas.

For more details circle 123 on Enclosed Return Postal Card.

Fluorescent Safety Flags

A new line of fluorescent danger flags for street and highway use was anounced by A. W. Pendergast Safety Equipment Co.

Reported to be a brilliant flame red, they have a high visibility. Durable and



Safety Flag

long wearing, the fluorescent vinyl is permanently bonded to both sides of the nylon base fabric. The new flags are being offered in an assortment of styles and sizes for use on sign and flag standards, barricades, traffic cones and trucks.

Albert W. Pendergast Safety Equipment Co., Tulip & Longshore St., Philadelphia 35, Pa.

For more details circle 124 on Enclosed Return Postal Card.

Rubber Asphalt Joint Sealer

A new sealing product, recently announced by the Horn Research Laboratories, is reported to seal joints in concrete highways, drives and streets.

The material comes in two forms: Hot-Poured; and Cold-Poured. The hot-poured type is a thermoplastic, rubberized asphalt compound designed specifically for horizontal joints to prevent the inflation of water, soil or solids. It meets Federal CAA, ASTM and Navy specifications, according to the manufacturer.

The cold-applied type is recommended primarily for the maintenance of older highways as well as for new construction. Reputed to be applicable for sealing of narrow joints, it also meets Federal CAA standards.

A. C. Horn Co., Div. of Sun Chemical Corp., 2133 85th St., North Bergen, N.J.

For more details circle 125 on Enclosed Return Postal Card.

End Dump Truck

A new end dump truck has recently been introduced by the KW-Dart Truck Co.

End Dump Truck

The 40 ton capacity vehicle, designated the 40SL is powered by a V-12 diesel engine coupled with a four-speed transmission-converter. Tires front and rear are 18.00 x 33.

KW-Dart Truck Co., Kansas City, Mo.

For more details circle 126 on Enclosed Return Postal Card.

Maneuverable Backhoe

A new backhoe that is said to offer the combined advantages of high flotation on 14 in. wide tires and excellent off-highway maneuverability has been announced by Hydraulic Machinery Co.

Able to attain speeds up to 50 mph. on job to job travel, the new machine is equipped with four-wheel drive, power-steer and a heavy duty chassis on

Maneuverable Backhoe

112 in. wheelbase. Designated the 250-OX, the hoe is all-hydraulic with 3 independent circuits that give full power on simultaneous digging and wing operations. The bucket is ⅝ yd. struck and will dig 13½ ft. deep with a reach of 20 ft. from pivot, on a 200 deg. swing. Available equipment includes all-weather operator cab and front-mounted winch.

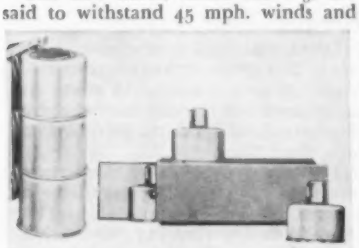
Hydraulic Machinery Co., Waukesha, Wis.

For more details circle 127 on Enclosed Return Postal Card.

Flare Kit

A new flare kit that is reported to meet ICC and state regulations for oil burning flares was announced recently by R. E. Dietz Co.

The new flares, called the V-3, are said to withstand 45 mph. winds and



Compact Flare Kit

burn brightly in rain or snow. The unit is a retractable burner, making it compact and assuring a primed wick for instant lighting. The three flares in the kit fit snugly in a double flanged box with an easy end opening.

R. E. Dietz Co., 225 Wilkinson St., Syracuse 1, N. Y.

For more details circle 128 on Enclosed Return Postal Card.

LOOK TO FLINTKOTE FOR JET FUEL RESISTANT PAVEMENT SEALERS...

Send today for complete specifications and technical data sheets on the following:

• **FLINTSEAL JFR*** (Hot poured) A one-component, rubber-tar thermoplastic compound to be melted and poured. Cools quickly, retains tough, elastic bond in pavement joints and cracks through cycles of expansion and contraction. Fed. Spec. SS-S-167b.

• **FLINTKOTE M-200** (Cold-Applied) Two-component, polymer type sealer. Sets quickly, resists aircraft fuel, heat and blast from jets. Bonds perfectly to concrete and remains ductile at minus 20°F. Interim Fed. Spec. SS-S-00200a and pertinent Purchase Descriptions, as modified.

• Also ask about exciting new Flintcrete†—Flintkote's polysulfide/epoxy concrete bonding compound for pavement restoration and repair.
• And Flintar*—coal tar pitch emulsion. Fed. Spec. R-P-00355a for sealcoating bituminous pavements. Write: The Flintkote Company, P. O. Box 157, Whippany, New Jersey.

*Reg. U.S. Pat. Off. †T.M. of The Flintkote Company

FLINTKOTE®

Manufacturer of diversified products for home and industry

. . . for more details circle 301 on enclosed return postal card

YOU CAN BID LOWER AND MAKE MORE PROFIT with a DOTMAR Curb, Gutter, Sidewalk Paver!

Dotmar Paver with extensions paves integral gutter, curb and sidewalk, 5' 10". In 8 hrs., averaged 1800 ft.

Dotmar with extensions paves state highway median strip 4 ft. wide, 3227 ft., in 11 hrs.

Dotmar paves gutter on expressway. A truly versatile machine. Averaged 2000 ft. in 8 hrs.

Dotmar paves curb and gutter over 3' per minute. Total job 14 miles long.

Hundreds of contractors are cutting costs and increasing profits with a Dotmar Paver. Save 1/3 to 1/2 over hand methods. Reinforcing rods can be used. Greater concrete yield. Easy to operate. Trowels for any shape of curb, sidewalk or highway strip. Pioneers in this equipment. Send for Catalog 57.

Makers of Dotmar Magnesium Forms.

Dotmar INDUSTRIES Inc.

501 HANSELMAN BUILDING KALAMAZOO, MICHIGAN

. . . for more details circle 300 on enclosed return postal card

New Products

Ramp Hoist

A newly designed hydraulic ramp hoist has been introduced by Schwartz Mfg. Co. The hoist is designed for transporting equipment weighing up to 15 tons. Equipment is drawn onto the platform by means of a hydraulic

Ramp Hoist

winch operating off the truck power take-off. When the equipment is in position, the platform is hydraulically lowered and the equipment may then be transported by truck.

Schwartz Mfg. Co., Lester Prairie, Minn.

For more details circle 129 on Enclosed Return Postal Card.

Grouser Bars

The Sur-Trac grouser bars, developed by American Steel Product Co., feature a special design for fast, easy welding.

The manufacturer reports that worm grouser pads can be reconditioned at a fraction of the replacement cost. After the worn grouser is cut or ground even, the new Sur-Trac bar may be welded in its place. The producer states that this can be accomplished without dismantling the track. The bars come in 10 ft. lengths, or they can be furnished pre-cut and ready for welding.

Steel Prod. Corp., 8700 Kinsman Rd., Cleveland 4, Ohio.

For more details circle 130 on Enclosed Return Postal Card.

Earth Augers

One of the first in a series of Pengo heavy duty earth augers developed by Petersen Eng. Co. is the AA96, capable of drilling holes 8 ft. in dia.

Earth Augers

Designed for use on the most powerful drilling machines available, the new AA series augers feature extra heavy duty design throughout. Attachment hubs are designed for 5 in. Kelly bars, but may be adapted to 3½ in. to 4½ in. bars by means of bushings.

Petersen Engineering Co., Santa Clara, Calif.

For more details circle 131 on Enclosed Return Postal Card.

Wooden Form Protective Coating

A new, highly concentrated compound of active organic ingredients that will penetrate into wood and coat it with a flexible layer impervious to water or chemical action, was announced by Brad Chemical, Inc.

Called Poly-Kote, the product can be mixed with ordinary fuel oil in a 54 to 1 ratio and be easily applied by brush, spray or mop. An advantage is that the coating can be applied right on the job, while the forms are up in place. The mixer is reported to resist settling or freezing and can be stored indefinitely.

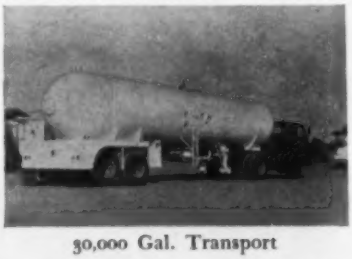
Brad Chemical, Inc., 111 W Washington St., Chicago 2, Illinois.

For more details circle 132 on Enclosed Return Postal Card.

30,000 Gal. Transport

A new T-1 steel transport with a 30,000 gal. capacity was recently announced by Master Tank & Welding.

Designed by Master, of Dallas, Texas, the transport has been sand blasted, stress relieved and X-rayed. Over the rustproof primer coat the tank is finished in hot processed enamel. All



30,000 Gal. Transport

guages are recessed in the side of the tank. For weather protection, the rear end is completely enclosed. Featured are vapor proof lights, nail guards and a manway cover.

Master Tank and Welding Co., 1600 Singleton Blvd., Dallas, Texas.

For more details circle 133 on Enclosed Return Postal Card.

Pick-Up Truckster

A new three-wheeled vehicle that could offer economy and maneuverability for light hauling and delivery at construction sites is being manufactured by Cushman Motors.

Titled the Cushman 780 Truckster, the vehicle will hold up to 800 lbs. and

Pick-Up Truckster

is suggested to replace expensive-to-operate light trucks on message and small tool errands. The unit may use a fibre-glass cab for inclement weather. The vehicle is powered by a 4 cycle, 7.95 hp. engine and has a three speed transmission which will deliver up to 50 mpg.

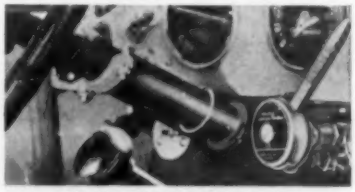
Cushman Motors, Lincoln, Nebr.

For more details circle 134 on Enclosed Return Postal Card.

Remote Tail Gate Lock

A new vacuum tail gate control kit was recently announced by Velvac, Inc. The new device allows the operator to operate the tail gate lock from the driver cab.

Designed for attachment to dump trucks with hydraulic brakes, the unit is said to be particularly useful where gravel and other materials must be



Hydraulic Gate Control

dumped in accurately measured quantity. Individual vacuum control levers in the driver cab permit unloading batches with accuracy.

Velvac, Inc., 3534 W. Pierce St., Milwaukee 3, Wis.

For more details circle 135 on Enclosed Return Postal Card.

Hinged Road Fabric

Development of a new hinged road fabric that gives highway builders the benefit of easy shipping, handling and installation was recently announced by Pittsburg Steel Products, Div. of Pittsburg Steel Co.

The new type of fabric features an off-center hinge running lengthwise on a sheet of welded wire fabric. The hinge folds flat, allowing easy stacking and shipping. Special cradle trucks and other cradle equipment may be eliminated. One single sheet of the new road fabric can be handled by two men, instead of four, and the flatness protected in shipping allows the material to lie flat when installed. The fabric is available in any style or gauge.

Pittsburg Steel Co., Grant Building, Pittsburg 30, Pa.

For more details circle 136 on Enclosed Return Postal Card.

Quick-Disconnect Spreader

A new quickly disconnected device for the dual spinner tail gate type Model B Hydro Spreader has been announced by Central Engineering Co.

The spreader is fastened to each side for the dump body by means of two pins. No bolts, nuts or tools are required. The pins make it possible to mount or to remove the spreader in a matter of a few minutes, the manufacturer states, and this can be accomplished without interfering with either the existing tail gate or the dump body. For spreading salt the hood is in a raised position allowing a variation of tail gate openings in accordance with the amount of salt being spread. The salt hood also makes it possible to

Spreader: Attaches Easily

wash or flush out the spreader without dumping the salt from the body, which in turn saves time and cost of reloading.

Central Engineering Co., Inc., 4429 W. State St., Milwaukee 8, Wis.

For more details circle 137 on Enclosed Return Postal Card.

Telescoping Tripod

A new telescoping tripod designed to stand up in winds of 25 mph. or more has been announced by Standard Signs, Inc.

Constructed of malleable castings, steel and aluminum, the legs lock and the extension column will hold in either open or folded positions. The three-flag-high height of the unit is 11 ft., measuring to the top of the center flag. Folded the stand is 57 in. high. Available with the 25 lb. tripod is an assortment of warning signs for simple attachment.

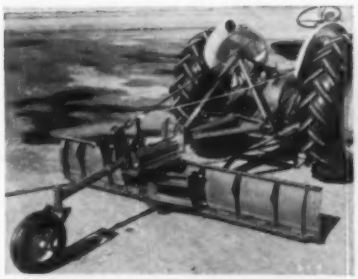
Standard Signs, Inc., 3190 E. 65th St., Cleveland 27, Ohio.

For more details circle 138 on Enclosed Return Postal Card.

Adjustable Blade

A new earth-moving implement with weight and capacity to perform with the newer model tractors has been introduceed by Ford Motor Co., Tractor and Implement Div.

The heavy duty rear-attached adjustable blade is designed to take large work loads, according to the manufacturer. Blade sizes of six and eight ft. are available. With frame members built of rugged steel tubing and with the blade reinforced throughout its length by an extra member of shaped heavy steel plate, the new implement will handle such heavy scraping and backfilling jobs as road grading and earth removal with ease, the company announced. Easily attached to all tractors with Categories I and II three-point implement linkage systems, it features a wide range of adjustments, many of which can be made from the tractor seat.



Rear-Attached Adjustable Blade

Tractor & Implement Div., Ford Motor., Birningham, Mich.

For more details circle 139 on Enclosed Return Postal Card.

Optional Equipment

A 107 hp. General Motors diesel engine, a range of bucket sizes and three new attachments are now available as optional equipment for the Michigan Model 85A Tractor Shovels, it was announced by Clark Equip. Co.

The new diesel engine is GM's Model 5043. The Model 85A Tractor Shovel is also available with a 96 hp. Waukesha Model 195 GK gasoline engine or a 91 hp. Waukesha Model 197 DLC diesel unit.

Optional Equipment

Optional buckets ranging in capacity from 1 to 2½ cu. yds. are now available for variety.

Versatility can be improved by the new attachments. The rotary snow plow can handle up to 1200 tons of snow per hr. A compact sweeper is available to replace the bucket. A hydraulic snap-mount backhoe is to be had for rear mounting, without the use of tools.

Clark Equipment Co., Pipestone Plant, Benton Harbor, Mich.

For more details circle 140 on Enclosed Return Postal Card.

COMMENT
from the
BUTLER ENGINEER

. . . For ADULT Roadbuilders, Ready Mixed and Concrete Products Producers ONLY . . .

Confidence is a prime buying motive in everything from suspenders to a plant to produce concrete. Whether it's a roadbuilder's set-up, a ready mix or a concrete products plant, you want assurance you're not going to get caught with your plants down.

. . .

After 3 years of research, cussin' and discussion, the 7 major concrete plant manufacturers, working as cooperatively as upper and lower teeth with the National Ready Mixed Concrete Association, have developed strict standards for bins, batchers, cement silos, conveyors — nearly every component for a concrete plant. Important are definitions of manual, semi-automatic and fully automatic single batchers; of manual, semi-automatic and fully automatic batching *systems* which incorporate cement, water and aggregate batchers.

This group is known as the Concrete Plant Manufacturers Bureau. It's part of the N.R.M.C.A. So, the Standards are as authoritative as St. Peter's thumbs-up or thumbs-down. The Bureau has developed Rating Plates for equipment made by its members. Here's an example:

This gives you a firm, positive basis for confidence in the equipment.

Now — add Butler Trademark . . .

BUTLER

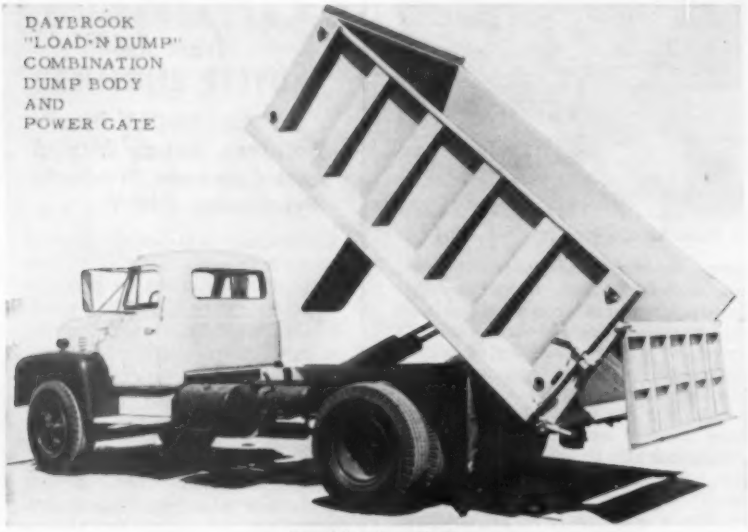
. . . and you have Reliability as firm as Mr. Gibraltar's Rock.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

. . . for more details circle 287 on enclosed return postal card

New Products



Combination Body

Dump Body/Power Gate

The availability of a dual purpose combination dump body and power gate unit, known as "Load N Dump", has been announced by Daybrook Hydraulic Div. of Young Spring & Wire Corp.

The outstanding feature of the new body is the tailgate that works either as a standard dump body gate for dumping or a hydraulically powered platform for loading and unloading and the dual mounting of both the gate and body on one chassis. Hydraulic systems for the two units are independent. A two-shaft power take-off permits separate operation of either the power gate or the body.

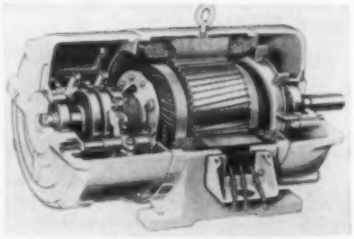
Daybrook Hydraulic Div., Young Spring and Wire Corp., 500 Lehman Ave., Bowling Green, Ohio.

For more details circle 141 on Enclosed Return Postal Card.

Rotor Motors

The availability of a new line of redesigned wound rotor motors to meet NEMA standards in frame sizes 213 to 326 U has been announced by the Louis Allis Co.

The new design features reductions in both size and weight while retaining the durable cast iron housing and end bracket construction with oversize grease reservoirs for protection against shock, corrosion and insuring minimum maintenance. Other improvements include: low rotor inertia design for proper response; and a class B insulation for greater protection against moisture, oil, dirt, weak acids and abrasive dust. Suggested to be used on cranes, hoists or elevators, they



Rotor Motor

can be furnished with open, drip-proof or totally enclosed, non-ventilated enclosures for horizontal, ceiling or side-wall mounting.

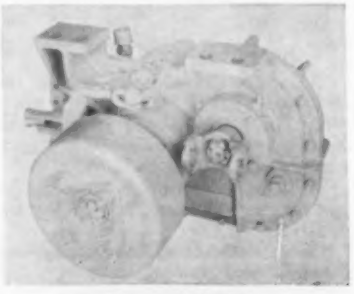
Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.

For more details circle 142 on Enclosed Return Postal Card.

Power Take-Off

A recently developed power take-off capable of transmitting full engine power to operate accessory equipment has been announced by Waterous Co.

A more compact version of an earlier model, it incorporates helical gears and is designed for use where short wheel base chassis pose problems, according to the manufacturer. It is reported to provide sufficient ground clearance for trucks that must travel off the road and over rough terrain. Mechanical linkage is replaced by an electric cable, making incab shifting possible. The PTO, as it is known,, is equipped with 3 point mounting, permitting it to move with the frame when the going gets rough.



Power Take-Off

Waterous Co., 80 E. Fillmore Ave., St. Paul 7, Minn.
lumbia Blvd., Portland, Ore.

For more details circle 143 on Enclosed Return Postal Card.

Conveyor Belt

A new heavy duty portable belt conveyor has been announced by the Atlas Conveyor Company, Clintonville, Wisconsin.

The new Model 130 can combine with vibrating screens, traps, feeders and hoppers to make a complete portable screening plant. The plant can be towed from one job site to another without any dismantling. It has been designed for heavy duty service in handling sand, gravel, dirt, stone, rock, and other bulk materials. Some of the design features of this new model are: low road clearance; hydraulic hoist; positive boom locking pins; shaft drive which allows easy access to engine; fixed or swivel axles and V-type cradle truck. The new Model 130 is available in belt widths of 18 in. to 42 in. Lengths are 40 ft. to 70 ft. c-c. A wide selection of vibrating screens and accessories are available.

Atlas 130 Conveyor Belt

Atlas Conveyor Co., P.O. Box 59, Clintonville, Wis.

For more details circle 144 on Enclosed Return Postal Card.

Individual Air Conditioner

A recently announced personal air conditioner for use on construction has now been redeveloped and some additions have been made. Jamieson Laboratories, the manufacturer, states that the mechanism is basically the same; an electrically powered unit containing a refrigeration system, a filter-blower, a flexible plastic hose, and a light fiberglas helmet and faceplate.

The model is designed on the theory that when your head is cool, the body feels cool all over. With this in mind, the new developments include a unitized steel housing on all refrigerated

Air Conditioner

parts, an improved filter, a more effective distribution of air in the helmet, and a heater unit that is easily attached to all dc models. The unit will operate on 6 or 12 volt ignition systems and requires no pulleys or belts.

Jamieson Laboratories, Inc., 1631 Colorado Ave., Santa Monica, Calif.

For more details circle 145 on Enclosed Return Postal Card.

Power Roller

A new roller that weighs 500 lbs. when filled with water or sand has been announced by Rowco Mfg. Co.

Reputed to handle as easy as a lawn mower, the finger-touch controls on the

Power Roller

handle regulate a Clinton 4 cycle 2¼ hp. engine. A combination V-belt and roller chain drive gives the unit a ground speed of from 2.5 to 3.5 mph. The roller is 18 in. in dia. and 24 in. wide. The drum, made of 11 gauge steel, has two drum plugs for draining.

Rowco Mfg. Co., Inc., 48 Emerald St., Keene, N. H.

For more details circle 146 on Enclosed Return Postal Card.

Safety Hat Liners

A variety of winter liners designed for use in all safety hats and caps is now being manufactured by the Fibre-Metal Products Co.

In addition to standard models, the line includes neoprene-coated liners without metal parts for use in electrical hats and caps, knitted liners for universal use and disposable liners for perspiration absorption and for use as a "visitor's" sanitary liner. Made of water-repellent, mercerized and sanforized fabrics, they feature gray outer flannels and red knit linings with adjustable chin straps. A snap-on mouthpiece to give additional face protection against cold and wind is also available.

Safety Hat Liner

Fibre-Metal Products Co., 5th & Tilghman St., Chester, Pa.

For more details circle 147 on Enclosed Return Postal Card.

Tube Model Files

Two new Multiroll Files for use in filing drawings such as plat or project plans has been introduced by Roll and File Systems.

The Multiroll 9 tube model consists of 9 individual tubes with 3¼ in. dia.

Blueprint Files

The files accommodate material up to 42 in., the rear openings are closed to prevent air circulation. Furnished with each unit is a visual index record which permits material to be located at a glance.

Roll and File Systems, P.O. Box 3863, Detroit 4, Mich.

For more details circle 148 on Enclosed Return Postal Card.

Table Model Radio

A new space-saving table model two-way radio has been designed by General Electric for commercial use, it has been announced.

Units up to 60 watts are available in low band, 25 to 54 mc. and 72 to 76 mc., and up to 50 watts in high band.

REPLACE AND SAVE WITH . . .

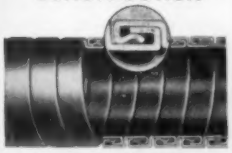
Flexonics

Free-Flowing

TAR & ASPHALT HOSE

- Heat-Proof
- Leak-Proof
- ¾" up to 12" I.D.
- Hose & Fittings to meet all equipment needs.

SUPER STRENGTH
FOUR WALL
CONSTRUCTION



Asbestos packed, interlocked construction . . . provides maximum flexibility.

USED AS ORIGINAL EQUIPMENT

IH 376

FLEXONICS CORPORATION
1423 S. 3rd Ave., Maywood, Ill.
Subsidiary of Calumet & Hecla, Inc.
Send me complete T&A hose data and name of distributor nearest me.

Name_____
Company_____
Address_____
City_____ Zone____ State_____

. . . for more details circle 305 on enclosed return postal card

New Products

Table Model 2 Way

144-174 mc. Also, 15 watts in UHF, 450-470 mc. Depending on the frequency selected, power amplifying equipment can be obtained on an optional basis, providing 250/330 watts output. Also available on an optional basis are units with selective-calling features, enabling the dispatcher to give messages to a single car or group of cars.

General Electric, Communication Products Dept., Lynchburg, Va.

For more details circle 149 on Enclosed Return Postal Card.

Wide Flame Torch

The development of a new torch with a wide flame range, reported to eliminate the changing of tips to achieve various torch capacities, was recently announced by Insto-Gas Corp.

Designated the No. 25 Torch, the flame ranges from pencil point flame 3 in. long to a lapping 12 in. flame, 1½ in. in dia. The manufacturer states

Wide Range Torch

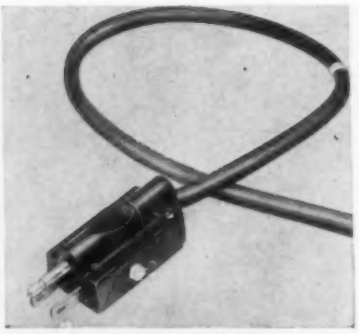
that the torch lights easily and won't blow out in wind. The flame, non-oxidizing, maintains an even temperature that eliminates hot spots. The new unit also has an air ring adjustment which can be used in extremely cold weather, when gas pressure is low, to stabilize the performance.

Insto-Gas Corp., 998 E. Woodbridge, Detroit 7, Mich.

For more details circle 150 on Enclosed Return Postal Card.

Circuit Breaker

A miniature circuit breaker designed specifically to protect small motors in portable power tools and appliances



Circuit Breaker

has been announced by Modern Mfg. Co.

The device attaches to the end of a cord within minutes and will protect the motor from burning out due to overload or overwork, according to the manufacturer. When the machine is overloaded or overworked the device will automatically cut off the power, and a reset button is used to reconnect the circuit. They are available from 3 to 10 amps.

Modern Mfg. Co., Inc., 680 Davisville Rd., Willow Grove, Pa.

For more details circle 151 on Enclosed Return Postal Card.

Hydraulic Outriggers

According to an announcement from Bucyrus-Erie Co., hydraulic outriggers are available for all B-E Transit Machines as optional equipment.

Horizontal travel of the beams as well as vertical movement of the leveling jacks are hydraulically powered. Hydraulic jacks rest on removable yet positively retained swivel-mounted aluminum floats. The outriggers are independently operated from the ground through six valve controls located on the left side of the carrier frame at the rear of the carrier cab. Four of the valves control the vertical motion of the jacks. The remaining two valves control the horizontal extension of front and rear outrigger beams.

B-E Transit Machines are said to be fully convertible for crane, dragline, clamshell, hoe or shovel service and are also available with manually-extended horizontal outriggers with plain ends for block mounting or with screw-type lowering jacks and aluminum

Hydraulic Outriggers

floats. Smaller models will also be available with manually-extended outriggers and hydraulically-powered vertical jacks.

Bucyrus-Erie Co., South Milwaukee, Wis.

For more details circle 152 on Enclosed Return Postal Card.

Small Radiophone

A small portable 100 milliwatt crystal controlled radiophone with receiver squelch has just been released by Morrow Radio Mfg. Co.

Called the VP-100, it has an average range of one half to three miles and

Radiophone

operates on any one of 22 citizen's band channels. The device is completely self-contained, with the exception of the lapel microphone. Two or more VP-100 units may be operated in communication or in conjunction with base stations of 100 milliwatts of power without licensing. The circuitry is printed on fiberglass.

Morrow Radio Mfg. Co., Salem, Ore.

For more details circle 153 on Enclosed Return Postal Card.

Portable Space Heater

An oil-fired portable space heater designed especially for the construction industry was recently announced. The new device will produce one million btu/hr. of heat at the rate of 7,000 cu. ft. of air per min., states Stow Mfg. Co., the manufacturer.

Designated the Stow S1000, it is said to be a furnace on wheels, complete with an automatic electric 10,000 volt continuous ignition. It is also equipped with an electric driven fan and an enclosed combustion chamber made of perforated stainless steel. Twin nozzles inside the combustion chamber burn kerosene or No. 2 fuel oil.

Stow Mfg. Co., Shear St., Binghamton, New York

For more details circle 154 on Enclosed Return Postal Card.

Classes in Safe Construction Blasting

In Connecticut recently construction people sat in on a series of classes on safety in blasting. The sessions were held by the state department of education with the highway department and Connecticut Road Builders Association cooperating. Dan Robinson, training coordinator with highway department, made the arrangements.

Five groups or classes totaling 150 have taken the 10-hour course to date. In attendance were contractor project foremen and crew leaders, and for the highway department various engineers in construction or safety supervisory positions.

Instruction was "professored" by Lt. Col. Richard Bemont, retired Corps of Engineers demolition expert. The topics included history of the art, standard blasting equipment, safety dules, primers, circuits, circulation of charges, typical blasting situations. Field demonstrations have been conducted in several quarries.

Road Need Study Being Made in Missouri

The Automotive Safety Foundation in recent weeks has supervised a state-wide study of highway and street needs in Missouri. This is one of a score or more such studies made by the Foundation in recent years, at the invitation of local authorities.

Under the direction of Robert Grunow the study is being directed on three levels—city, county and state. The purpose is to determine the state's needs overall, for purposes of setting up a long range program and determining sound priorities.

The study to be completed late this year is being made at the direction of the Highway Commission and the Joint Legislative Road Committee. The latter group was established in 1959 by the State General Assembly.

A University of Missouri Research team has been retained by the Commission to direct a related financial study, also to be ready by December 1 for the Legislative Committee.

Manufacturers' Literature

TRANSMISSIONS: A detailed breakdown of the makes and types of transmissions used by Class I and II carriers is featured in Vol. 9, No. 3 of *Transmission Topics*, published by Fuller Mfg. Co., Kalamazoo, Mich. Also featured in the current issue are instructions for the operation of Fullair Control, a list of gear ratios available and the conclusion of Eaton Mfg. Co. analysis of truck axles failures.

For more details circle 155 on Enclosed Return Postal Card.

LONG MATERIALS TRUCK: A newly designed truck for hauling steel, pipe or other long materials has been announced in a booklet by International Harvester, 180 N. Michigan, Chicago 1, Illinois. The design of the centered, narrow cab results in an unobstructed area 21 in. wide that runs the full length of both sides of the truck. An optional front outrigger prevents lateral road shifting. The cab is 50 in. wide and models range from 16,000 to 47,000 lb. gross weight.

For more details circle 156 on Enclosed Return Postal Card.

VIBRATING FEEDERS: A new straight-line vibrating feeder which is said to incorporate a new principle of vibration for high-capacity and controlled feeding of heavy and abrasive bulk materials is now being published by Link-Belt Co., Prudential Plaza, Chicago 1, Ill.

The literature describes two models that can be either cable suspended or floor-mounted and are available in 30 sizes with capacities up to 1,350 tph. Reinforced universal brackets provide for floor, ceiling or combination floor and ceiling mounting.

For more details circle 157 on Enclosed Return Postal Card.

CONCRETE CONSTRUCTION: The availabilty of a new catalog, No. 100, was announced by the sales dept. of W. R. Meadows, Inc., 26 Kimbell St., Elgin, Ill. Entitled "Sealtight Products For Concrete Construction", the catalog covers the wide and varied line of products available from this manufacturer for use in the construction of highways, bridges and airports. It includes expansion joints, joint sealing compounds and control joints.

For more details circle 158 on Enclosed Return Postal Card.

COMPACT TRENCHER: Small but tough, the Cleveland Model 92 Trencher is described in a new 12 pg. folder published recently by the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio. Brief copy and action photos illustrate how the special design and construction features of the Model 92 are employed on all types of trenching jobs.

For more details circle 159 on Enclosed Return Postal Card.

MERCURY-LAMP BALLAST: A new ten pg. publication, from General Electric Co., Schenectady 5, N. Y., discusses how to select and apply G. E. mercury-lamp ballasts. Ballast types include standard indoor and special purpose weatherproof and high temperature units. The publication contains list prices, dimensions, wiring diagrams and other data for selecting and applying both standard and special mercury-lamp ballasts.

For more details circle 160 on Enclosed Return Postal Card.

DENSITY TESTS: A new two pg. bulletin describing desity tests, and the application of the Volumeasure apparatus for in-place tests is available from Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill. Designed to simplify and facilitate the job of testing in-place densites of soils and construction materials, the unit employs a water-filled ballon principle to measure the volume of a test hole against the weight of the materials removed from the hole. The apparatus has many variations.

For more details circle 161 on Enclosed Return Postal Card.

AGGREGATE CONCRETE: The use of lightweight aggregate concrete in modern construction is featured in a 20 pg. publication issued by Master Builders Co., Cleveland 18, Ohio. Thirteen construction profects are featured with discussions covering the use of lightweight concrete as a strong, durable structural material for columns, beams and floor slabs and bridge decks.

For more details circle 162 on Enclosed Return Postal Card.

IN-PLACE MIXER: The Pulvi-Mixer, a self-propelled rotary in-place mixer, is described in a new 4 pg. brochure, published by the American Marietta Co., Milwaukee 1, Wis. Illustrations show the Pulvi-Mixer in various types of road stabilization. Basic rotary mixing principles are explained.

For more details circle 163 on Enclosed Return Postal Card.

SERVICE MANUAL: A 40-page Service Manual covering specifications, lubrication, maintenance and repair of eight of the ten-speed transmissions, has been issued by Fuller Mfg. Co., Kalamazoo, Mich.

Models covered in the new manual are the Fuller 10-FA-65, 10-FA-650, 10-CA-65, 10-CA-650, 10-FB-65, 10-FB-650, 10-CB-65, and 10-CB-650 transmissions. To provide graphic assistance in maintaining and repairing the 10-speed transmissions, Fuller has combined step-by-step maintenance instructions with 115 photographs illustrating the steps taken in disassembly and assembly of the units.

For more details circle 164 on Enclosed Return Postal Card.

VIBRATORY MATERIALS: A new condensed catalog of vibratory materials handling equipment, vibrating parts handling equipment, power rectification equipment and portable power tools has been announced by the Syntron Co., Homer City, Penn. The 68 page catalog presents descriptions, data and specifications on all Syntron products. Listed also are the Syntron representatives.

For more details circle 165 on Enclosed Return Postal Card.

GROUT FAILURE: A new booklet just released by the Master Builders Co., Cleveland 18, Ohio, explains how to avoid grout failure through shrinkage by using non-shrink grout. The 16 pg. bulletin describes successful grouting techniques and outlines and illustrates common methods.

For more details circle 166 on Enclosed Return Postal Card.

TRACTORS: Thirty-three action photos in a new four-color 16 pg. booklet produced by Ford Motor Co., 2500 E. Maple Rd., Birmingham, Mich., show Ford loaders, backhoes, dozers and cranes in use with Ford tractors. The applications described include heavy and light excavating; heavy and light loading; scraping; and general utility.

For more details circle 167 on Enclosed Return Postal Card.

CRAWLER TRACTORS: A new 20 min. film, in full color, features recently announced Oliver OC-9 and OC-96 crawler tractors. Produced by Oliver Corp., 400 W. Madison St., Chicago 6, Ill., the film, "A Prime Move Forward", explains the simplified operation achieved with the Trans-O-Matic transmission. With operating scenes, the film takes the viewer through typical operations and "clocks" various cycles.

For more details circle 168 on Enclosed Return Postal Card.

TRACTORS: How the power shift transmission, lifetime lubricated rollers and other advanced features of two of the largest tractors in the Caterpillar line boost production and save time and money for their owners is told in an eight-page booklet released by Caterpillar Tractor Co., Peoria, Illinois. Titled "The Men Who Know," the booklet takes the reader on the job to learn from the owners and operators their reasons for choosing Caterpillar D8 and D9 Tractors.

For more details circle 169 on Enclosed Return Postal Card.

CRUSHERS: A new 4-page bulletin covering the full range of Symons Primary Gyratory Crushers is announced by Nordberg Mfg. Co., Milwaukee, Wisconsin.

Symons Primary Gyratory Crushers are built in 30, 42, 54, 60 and 72 in. feed opening sizes, for capacities from 250 to over 3500 tons per hour. Featured photographically are the 42 in. HD2 and the 60 in. Gyratory Crushers completely assembled. Design features are illustrated by means of photographs of the main shaft assembly, countershaft assembly, eccentric support plate assembly and bottom shell and a view showing the spiders for both a 42 and a 60 in. Gyratory Crusher.

For more details circle 170 on Enclosed Return Postal Card.

RENEW ASPHALT SURFACES: A new two pg. bulletin on Para-Seal, a new black-top sealer coat that is designed to renew asphalt surfaces, has been issued by Paramount Industrial Prod., Co., 2717 E. 75th St., Cleveland 4, Ohio.

The literature explains how the sealer helps prevent premature deterioration of black-top pavement and describes how the product affects the pores to prevent damage. The product is said to be easily applied by brush or rubber squeegee.

For more details circle 171 on Enclosed Return Postal Card.

SAFETY EQUIPMENT: A new pamphlet, the PROTECTOR, covering hats, and safety tips to prevent accidents, has been issued by Wilson Products Div., 212 E. Washington Ave., Madison 10, Wis.

Concerned with improved methods, equipment and ideas, the new publication contains case histories and new products. The Wilson PROTECTOR has been acclaimed in technical fields where specialization makes interchange of information between manufacturer, dealer and customer increasingly complex, states the manufacturer.

For more details circle 172 on Enclosed Return Postal Card.

VAPOR SEAL: A new catalog that discusses the need for a true vapor seal in modern construction has been released by W. R. Meadows, Inc., 26 Kimball St., Elgin, Ill.

Graphically, it illustrates how Sealtight meets the needs. Application information, specifications and installation data is also included.

For more details circle 173 on Enclosed Return Postal Card.

TRACTOR SHOVELS: A new bulletin describing two large capacity "Michigan" Tractor Shovels will be of particular interest to swing shovel users seeking the added mobility of rubber tired digging and loading units, according to Clark Equipment Co., Benton Harbor, Michigan. The booklet is broken down into convenient reference sections for each model.

For more details circle 174 on Enclosed Return Postal Card.

NEW EQUIPMENT SERIES: A new 12 pg. booklet based on the first few feet of material moved on a new job site has been issued by Caterpillar, Peoria, Ill.

Titled "The First Few Feet", after its theme, the booklet outlines the new series of Cat tractors, motor graders and traxcavators and their proper uses on the job.

For more details circle 175 on Enclosed Return Postal Card.

LOAD-RATING: Daybrook hoists are featured in a folder, "Which Hill Would You Rather Climb," recently released to all dump truck operators. Daybrook Hydraulic Div., Young Spring & Wire Corp., Bowling Green, Ohio, the manufacturer, has also included a Load-Rating Chart for every hoist model, with an explanation. Telescopic hoists are featured for tandem and single axles trucks, trailers and trains; also, underbody hoists for medium, extra medium, heavy and extra heavy-duty work.

For more details circle 176 on Enclosed Return Postal Card.

TANDEM TRUCKS: Complete engineering data on White's new 4264S tandem truck designed for the construction industry is described in a 4 pg. folder available from White Truck Div., White Motor Co., 842 E. 79th St., Cleveland 1, Ohio. The Literature describes the truck as having a standard chassis that weighs 10,850 lbs., with fuel and features heavy-duty main and four-speed auxiliary transmission. The Super Mustang gas engine is reported to develop 170 hp.

For more details circle 177 on Enclosed Return Postal Card.

SAFETY LIGHT STANDARDS: A bulletin, descriptive of Porta-Stand flasher safety light standards has been announced by the R. D. Fageol Co., Kent, Ohio. The contents include complete specifications, dimensions and suggestions for protective use. The units can be used with all Fageol Flasher Light models.

For more details circle 178 on Enclosed Return Postal Card.

CONCRETE FINISHERS/VIBRATORS: A new float-finisher-grinder contained in one unit is described and illustrated in a broadside released by Dart Mfg. Co., 1002 S. Jason St., Denver 23, Colo. The literature illustrates and explains the operation and application of this three-in-one finisher. Equipped with a 3 hp. Briggs & Stratton gasoline engine, the unit has interchangeable 35 in., 44 in. float and finisher blades. Also available from Dart is a six page folder describing various concrete finisher and vibrator equipment.

For more details circle 179 on Enclosed Return Postal Card.

ARC WELDING: "Vest Pocket Guide to Better Welds," a revised edition of "How to Get Better Welds," contains 80 pages of arc welding information and is now available from Hobart Brothers Co., Troy, Ohio. It gives information on five essentials for proper welding procedures, examples of good and bad welds, welding positions, operator qualifications, welding metals, and welding training aids.

For more details circle 180 on Enclosed Return Postal Card.

MOBILE RADIO: Complete descriptions of all two-way mobile radio base station equipment available from Motorola are contained in a new booklet published by Motorola Inc., Technical Information Center, Communications and Industrial Electronics Division, 4501 W. Augusta Blvd., Chicago 51, Illinois. Specifications are given along with photographs of upright cabinets, remote control and desk top consoles and special AC utility base stations. Several pages are devoted to descriptions of the various base station antennas, monitor receivers and the firm's "Quick Call" selective signalling system.

For more details circle 181 on Enclosed Return Postal Card.

V BELTS: A comprehensive catalog covering its line of industrial V-Belts, including Cog-Belt, Poly-V and fractional horsepower types, as well as sheaves and industrial hose, has been issued by Dayton Industrial Products Co., 2001 Janice Ave., Melrose Park, Illinois. The 52 page catalog lists the complete Dayton Product line with data on sizes, dimensions and prices. A special section on hose lists information about the company's line of molded braided, horizontal braided, machine-built wrapped fabric, hand-built wrapped fabric and woven jacket hose. Data also covers recommended hose applications in specific fields, such as dairy, petroleum, construction and dredging.

For more details circle 182 on Enclosed Return Postal Card.

FORK TRUCK: A new sound and color slide film illustrating applications and advantages of pneumatic-tired fork trucks of 15,000 to 40,000 lbs. capacity has been produced by the Industrial Truck Div. of Clark Equipment Co., Battle Creek, Mich. Titled "Dollars and Sense", the slide film shows how Clark lift trucks can move heavy loads over rough terrain or snow. Efficiency and low operating points are stressed.

For more details circle 183 on Enclosed Return Postal Card.

STEEL WHEEL ROLLERS: The Amrol 8 and the Amrol 12, new steel wheel rollers, are described in an illustrated 6 pg. brochure, available from American-Marietta, Milwaukee 1, Wis. The literature covers such features as direct-drive, selective control and dual-position throttle.

For more details circle 184 on Enclosed Return Postal Card.

NOW! Get Circulation Where It Counts . . .

Roads and Streets' Clearing House REACHES THE MARKET'S HEART

INDIVIDUAL CONTRACTORS
CITY, COUNTY ENGINEERS
CITY, COUNTY OFFICIALS

Long a leader serving the heavy construction and associated fields, ROADS AND STREETS' "cream" circulation goes to the important men in the business. They are the men, who directly or indirectly influence the purchase and sales of new and used equipment and supplies.

When you are "in the market" reach the logical buyer or seller quickly—at a reasonable cost to yourself.

Use the Clearing House!

Just clip the coupon below and attach your copy.

CLIP YOUR AD COPY TO THIS HANDY ORDER FORM AND MAIL TO

CLEARING HOUSE SECTION ADVERTISING RATES

TRANSIENT RATE — $11.00 Per Column Inch Per Insertion

CONTRACT RATES — Based on use of total space indicated within yearly period.

12 in.	$10.45
24 in.	10.35
36 in.	10.00
48 in.	9.90
60 in.	9.80
90 in.	9.65
120 in.	9.50
180 in.	9.25
360 in.	9.00

COPY AND CLOSING DATES

Final closing date is the Fifteenth of the preceding month. Magazine is issued 1st of publication month. If proof is desired, copy must be received 5 days preceding closing date.

CLEARING HOUSE SECTION ROADS AND STREETS

22 W. MAPLE STREET, CHICAGO 10, ILL.

Please Insert the Attached Advertising Copy in the Next Issue of ROADS AND STREETS to Occupy_____Inches of Space.

Number of Insertions_____.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

TELL US WHAT YOU HAVE TO OFFER AND WE'LL SET UP THE AD FOR YOU.

SUB-SURFACE SOILS: A new manual has been prepared by Associated Research, Inc., of 3777 W. Belmont Avenue, Chicago 18, Illinois, that details procedures for using the Barnes Layer Method to determine an exact inventory of sub-surface soils by quantity, quality and location. According to the publication, the Barnes Layer Method utilizes conductance of the earth, as measured by a portable electrical instrument, the Model 274 M Michimho-Vibrotester, weighing only 20 pounds. These measurements are fully effective even when gravel and sand strata are covered by layers of clay. Operation is not affected by extraneous noises, vibration or ground currents.

For more details circle 185 on Enclosed Return Postal Card.

LIQUID/DRY BULK UNITS: Tank operators are presented with a comprehensive picture of the entire Fruehauf line of liquid and dry bulk units described and illustrated in the new 24 page "Fruehauf Tank-Trailer" catalog, by Fruehauf Trailer Co., Detroit 32, Michigan. This catalog gives design features, specifications and options of the aluminum, steel and stainless steel trailers that can carry asphalt, gasoline, edible cargoes, powdered commodities and chemicals. To answer some of the special problems involved in tank operation, the catalog has a section devoted to the various types of Fruehauf safety equipment accessories.

For more details circle 187 on Enclosed Return Postal Card.

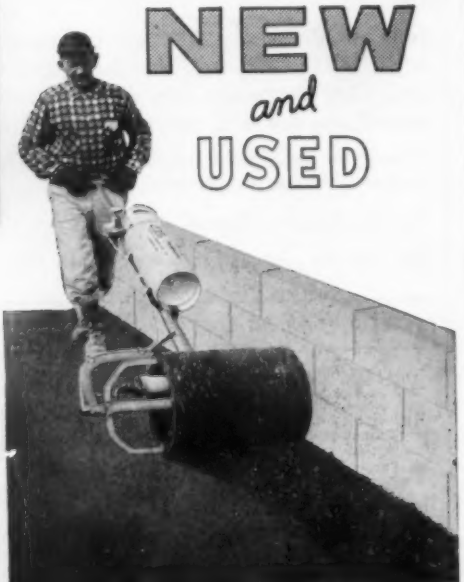
Continued on page 206

RUST REMOVER: A new folder from Rusticide Products Company, 3125 Perkins Av., Cleveland 14, Ohio, tells how "Rust-I-Cide" cuts labor time and avoids replacement costs by removing rust and conditioning metal surfaces. The variety of applications described includes: cleaning rusted equipment; machinery; automotive equipment; tools; and piping. Also, preparing new metal, including aluminum and galvanized, and rusted metal for painting.

For more details circle 186 on Enclosed Return Postal Card.

ROTARY SWEEPER BROOMS
WE MANUFACTURE
• Austin - Western • Cub Low Boy • Det-Harvester • Fordson • Ferguson • Grace • Guttersnipe • Hough • Huber • Joe-Willy's • Littleford • Little Giants

• Mall (M.B.) • Blumberg • Ram • Rosco • Spearswell • Tampo • Wayne Model 450 • And Many Others
Special Cores made to order
$69.50 Up
• COCOA ROLLER MATS •
Drag Broom Levelers
Street Push-Concrete Brooms
RE FILLING BUILDING PAIRS
KENNEDY'S
VAN BRUSH MFG. CO. Inc.
2728 McGee Trfwy. Kansas City, Mo.

ELLIS
FINISH THE JOB RIGHT
• COMPACTION - SMOOTHNESS
FLUSH TO FOUNDATIONS WALLS - CURBS
NO PLACE TOO SMALL
JOBS FINISHED WITH ELLIS HEATED ROLLERS GIVE YOU A BETTER REPUTATION
NEW and USED

5 TON COMPACTION — WATER TIGHT SEAL
HEATED ASPHALT ROLLERS
ELLIS HEATED ASPHALT ROLLERS
For additional information contact:
Box 160 Liberty, Missouri
PERFECT MACHINE FOR ASPHALT FINISHING

ACME SCREENS
for GRAVEL · SAND and OTHER ABRASIVE MATERIALS
WOVEN FROM THE FINEST QUALITY ALLOY STEEL WIRE

SUPPLIED TO YOUR SPECIFICATIONS
Acme IRON WORKS
P. O. Box 2020 • San Antonio 6, Texas
Manufacturers Of The Famous Ingram Rollers
Mail This Coupon Now
FOR PRICES AND INFORMATION.
WIRE SCREEN SPECIFICATIONS:—
FIRM OR INDIVIDUAL
ADDRESS
CITY STATE

SALES MANAGER WANTED

A leading Middle West manufacturer of road building and mining machinery wants a General Sales Manager. The manufacturer has two main product lines sold through domestic distributors. Experience in the sales management of road building, construction and/or mining machinery is essential. Duties require about 35% travel in the United States and Canada. Send complete personal data and detailed experience resume with initial correspondence. All inquiries treated in strict confidence.

Box No. 1232

FOR SALE

Continuous Mix Pioneer Model 81 Asphalt Plant —

80 to 100 TPH, S/N 88-112. Mixer & Gradation Unit complete with 3-deck 4' x 8' Vibrating Screen, Mixer Elevator and Fines Feeder, complete with electric motors. Hot Elevator. Cold Feeder — 20-ton Capacity, two-compartment with Apron Feeder and Electric Vibrator. Portable Conveyor (Barber-Greene) from Cold Feeder to Dryer. Mobilsteel Super-Dryer 32' x 6' with High Pressure Steam Burner. Power Unit for Dryer: Caterpillar D-11000 — Faulk Reduction Unit with Chain Drive. Dust Collector — Dry Type. Boiler (Lucy 125 H.P.). Asphalt Pump — Yale & Towne 3" 100 G.P.M. Fuel Oil Pump. Generator Unit—Caterpillar D-13000 engine — Lewis Allis 75 KW AC Generator.

Plant is 4 years old and in operation. The dryer is 3 years old. Everything is in excellent condition and unusually clean. We cannot see this plant in West Florida within 100 miles of Pensacola, but no other restrictions.

Priced for a quick sale at $45,000

TERMS: EXCEPTED: CREDIT ⅓ CASH. NO TRADES.

MAY MACHINERY COMPANY, INC.

Telegraph Road, MOBILE, ALA., Phone HE. 3-9559 — P. O. Box 395 CHICKASAW, ALA.
Night Phones: W. A. May, GR. 7-6153; Tom Ford, GR. 7-5323; J. G. Watson, GR. 9-4886.

FOR SALE

D8 Cat with No. 25 DDPCU and Cat 3S dozer blade.

Cedar Rapids 30x42 impact breaker, completely portable.

Adams 610 Grader 6-cylinder diesel, power steering, 1400x24 tires all around. (I have two and will sell one) (take pick).

60'x20' portable conveyor new belt, gas power.

Above machines all in good condition and working at present time

Kessen Construction Company
Rochelle, Ill.
Phone 849R
Evenings Phone 609M5

FOR SALE
(1) PUMP

Jaeger
Model No. 6-PEL
Serial No. P-150005
with 25 HP Electric Motor
Mounted with
20 ft. suction hose
Used only 2 hours
Priced at
$800

WILLIAM CAVE CRUSHED STONE CO.
221 College St., French Lick, Ind.
Office Phone—WEllington 6-4923
Res. Phone—WEllington 6-9639

Amphibious Vehicles

MK4 (LVT) (4) Designed For Hauling and Towing Supplies and Equipment Over Rough Terrain and Water. Unused, Like new. 250 H.P. Continental 7 Cylinder Radial Air Cooled Engine.

$1,795

(Original Cost $42,800)

Medium Tanks

M4A3 (Demilitarized) Unused 500 H.P. Ford Type Eight Cylinder Engine.

$1,995

(Original Cost $78,000)

BARON STEEL COMPANY
4075 Detroit Avenue
Toledo 12, Ohio
Phone: GReenwood 9-5357

Send For Descriptive Brochures

EQUIPMENT FOR SALE

1—HD 21 Allis-Chalmers Tractor w/Hydraulic angle Blade
1—HD 21 Allis-Chalmers Tractor w/Hydraulic Blade—rebuilt
1—HD 21 Allis-Chalmers Tractor w/Hydraulic Blade—rebuilt
1—HD 20 Allis-Chalmers Tractor w/Hydraulic Blade—rebuilt
1—HD 21 Allis-Chalmers Tractor w/Cable Blade—rebuilt
1—HD 6G Allis-Chalmers Tractor—rebuilt
1—HD 6E Allis-Chalmers Tractor w/Angle blade—demonstrator
1—HD 5B Allis-Chalmers Tractor w/Angle blade—rebuilt
2—TS 260 Allis-Chalmers Motor Scrapers, 800 hours
1—HD 19 Allis-Chalmers Tractor w/Cable Blade—as is
1—HD 19 Allis-Chalmers Tractor w/Hydraulic Blade—as is
1—HD 19 Allis-Chalmers Tractor w/Hydraulic Blade
1—HD 15B Allis-Chalmers Tractor w/Hydraulic blade, rebuilt
1—HD 11E Allis-Chalmers Tractor w/Hydraulic blade—like new
1—HD 11E Allis-Chalmers Tractor w/Hydraulic blade—like new
1—HD 16DC Allis-Chalmers Tractor w/Hydraulic blade—like new
1—TL-10 Allis-Chalmers Tractor Loader—shop
1—TL-10 Allis-Chalmers Tractor Loader—demonstrator
1—TL-6 Allis-Chalmers Tractor Loader—shop
1—HD 7W Allis-Chalmers Tractor w/Hydraulic blade—as is
1—HD 10W Allis-Chalmers Tractor w/Baker blade
1—HD 14C Allis-Chalmers Tractor—bare
1—HD 14 Allis-Chalmers Tractor w/GarWood Blade & Winch
1—HD 14 Allis-Chalmers Tractor—bare
1—P & H ½ cu. yd. Shovel—as is
1—1879 Buda Motor—rebuilt—guaranteed
1—6DAS—844 Allis-Chalmers engine—guaranteed
1—471 GM Engine—guaranteed
1—671 GM Engine—guaranteed
1—Buda 844 Engine—guaranteed
1—371 GM Engine—guaranteed
1—271 GM Engine—guaranteed

SCRANTON TRACTOR & EQUIPMENT CO.
413-415 Walnut St. Scranton 9, Pa.
Phone: DI 7-3385

PRICE IS RIGHT

Cedar Rapids Portable Primary 20" x 36" R.B., 30" belt, feeder truck loading hopper, D-8800 Power Unit, tandem rubber, air brakes.

Lippman Portable Plant, 20 x 30 jaws R.B., 30 x 18 rolls, R.B. rotavator 3' x 8' double deck screen and feeder, tandem rubber, air brakes.

Cedar Rapids, skid mounted, 12 x 36 twin jaw R.B., powered by UD-18 diesel.

Late Model TD-18A International Tractor, 3 yard Drott bucket loader.

All the Above Equipment in Excellent Shape and Reconditioned. Check Them Over, Look, At Our Maintenance Records.

WILTGEN STEEL BUILDING SALES
P. O. BOX 816 PHONE 299
LE MARS, IOWA

Used Equipment Available

Item 1. Allis-Chalmers Model HD-20H Crawler Tractor with Car Wood Cable Dozer and Cable Control Unit. Fully reconditioned — $16,000.00 — an excellent buy.

Item 2. Allis-Chalmers Model HD-20H Crawler Tractor with Car Wood Cable Dozer and CCU. Good operating condition—$13,000.00

Item 3. A-C Model HD-15GC Diesel Tractor Shovel. Reconditioned—$12,000.00—outstanding value.

Item 4. A-C Model HD-15A Diesel Tractor with Car Wood Hydraulic Bulldozer. Rebuilt—$14,000.00—a bear for production.

Item 6. A-C Model HD-11G Diesel Tractor Shovel. Reconditioned — $17,500.00 — years of high production in this machine.

Item 7. A-C Model HD-11B Hydraulic Bulldozer with Model 11BD Hydraulic Bulldozer. Reconditioned — $10,500.00.

Item 8. Allis-Chalmers Model HD-11B Hydraulic Bulldozer with Model 11BD Bulldozer. Reconditioned—$12,500.00. Both these 11B's are outstanding values.

Item 10. C H & E 3 ton Roller. Excellent condition — one of our best buys — $1,500.00.

Compressors—If you need a compressor see us for outstanding values in Jaeger Models 75', 125' and 250'.

We Have Used Parts for Allis-Chalmers HD-20 Tractors

Write to us for list & prices

All prices are f.o.b. New York, New York.

FRANTZ TRACTOR COMPANY, INC.

2740 Ewen St. Telephone: Kingsbridge 8-3000 New York 63, N. Y.

RENTAL PURCHASE

CEDARAPIDS 3240 Jaw Portable Primary Plant with feeder, hopper, conveyor, tandem rubber, all factory built, late model, excellent. Priced for quick sale.

CEDARAPIDS 2036 Jaw Portable Primary with feeder, conveyor, Cat. diesel, tandem rubber, rebuilt completely. $18,000.

EUCLID Twin Power Motorscraper. 18-24 cy., two 190 hp. GM diesels, torque converters, just factory rebuilt. $1850 mo. $18,000.

EUCLID 22-ton End Dumps, 36TD, late model, torque converters, Cummins diesels, good. $1000 mo. $13,500.

MICHIGAN 175AD Loaders, good reasonable.

KOEHRING 25-ton Motorcrane, 304, used 1980 hrs., late model, like new. $1250 mo. $20,000.

QUICKWAY 125A Backhoe, new 1956, 6/10 cy., on 4-ton 6x6 carrier. Excellent. $400 mo. $6000.

QUICKWAY L Backhoe on 4-ton 6x6 carrier, 4/10 cy., very good. $300 mo. $2500.

BANTAM T35 Backhoe on Bantam 200 Motorcrane Carrier, gooseneck boom, good. $450 mo. $6750.

GALION 5-8-ton Tandem roller, new 1954, excellent. $350 mo. $3500.

BUFFALO SPRINGFIELD 8-12-ton Tandem Roller, KT19A8, new 1957. $475 mo. $5500.

CLEAVER BROOKS 3-Car Heater, portable, excellent. $1350.

DEARBORN AUGUR on Ford Tractor, good. $600.

WRECKING BALLS, 6000 lbs. new, pear shaped. $350.

(2) **AMERICAN** 2-Drum Hoists with 40 hp. gasoline engines, excellent. $750 each.

ARPS TRENCH HOG, like new, on late model. For tractor. $300 mo. $2350.

CRANE 20-ton Lo-Boy Trailer, tandem, new. $350 mo. $3000.

WENZEL MACHINERY CO.

565 S. 10th, Kansas City, Kansas

MAyfair 1-1710

FOR SALE

CASE 1000 Front End Loader with Scarifier - Esco Teeth 1400 hrs. Ser. #7101008. Price—$14,500.

BUCYRUS-ERIE 22-B-318 Caterpillar Diesel Backhoe yard and ⅓ Bucket, Electric Starter. Long Caterpillar Mounting 36" Shoes—$20.000.

MARSH EXCAVATING CO., INC.

12204 W. Blue Mound Road

MILWAUKEE 13, WISCONSIN

Ph. GL 3-3384

New Standard Size Chrysler Industrial Crankshafts, 8 cylinder, 5" fly wheel flange Part No. 1115281 $ 38.50

50-ft. Crane Boom for Model 79 Lorain.....$ 600.00

New Hoist Brake Band Assembly with lining for Bucyrus-Erie 22B .....$ 8.00

New Hoist Brake Band Assembly with lining for Model 34 Lima .....$ 8.00

New Hoist Brake Band Assembly for 1½ Yd. Lima $ 10.00

New Hoist Clutch Band Assembly for Model 61 Hanson Crane.....$ 8.00

New M-6 38-ton High Speed Tractor $2,500.00

All items F.O.B. Fort Wayne, Indiana

P.H.R. Surplus Sales, Inc.

2840 Lincoln Highway West

Fort Wayne, Ind. Ph. TRinity 6415

FOR SALE

1—**Link-Belt LS-85** Crane or Dragline, Cat. D-318 Diesel Engine, 50' boom, 7 years old—very good condition.

1—**White Model L-8** Asphalt Plant with gasoline engine—good condition.

1—**Barber-Green Mix-All** with gasoline engine, on two pneumatic tires—good condition.

1—**Garwood Model 524,** 15-18 yd. tractor drawn Scraper, good tires—good condition.

1—**Curtiss-Wright Model 150-B** 20-26 yd. tractor-drawn Scraper, air brakes, practically new.

1—**Littleford Model 115** Tankar Heater—good condition.

Discount to Dealers

WILSON MACHINERY & SUPPLY CO.

561 West Fourth Street

Lexington, Kentucky

Phone 3-1450

FOR SALE

NORTHWEST 80D SHOVEL
serial #12864
Good Condition

CAT DW21 with PR21 ROCKWAGON
serial #8W1488
Good Condition

3 - CAT DW21 with PR21 ROCKWAGONS
serial 86E2300 series
Very Good Condition

Albert Lalonde Company

Box 71 Phone 454

Sidney, Mont.

SALE, RENT, OR LEASE ON YARDAGE BASIS

Four Harvester TS-75 Pay Scrapers, New 1956 and in top condition—70% rubber. Ea. $17,500.00

CLAREMONT MACHINERY, INC.

734 15th Street, N. W. Tel. EXecutive 3-0118

Washington 5, D. C.

GIANT SALE!

CONSTRUCTION EQUIPMENT FROM MAMMOTH TRINITY DAM PROJECT

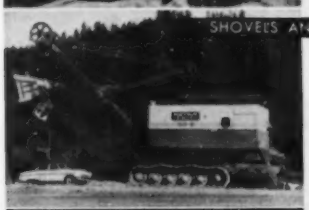
CALIFORNIA

(FOR DELIVERY LATE SEPTEMBER)

Liquidating $14,000,000.00 worth of well-maintained, top name equipment at **BARGAIN PRICES!**

CONVEYOR SYSTEM

2 miles long, 42" wide rubber belt. 9 flights, available individually, ranging from 672 ft. long to 1885 ft. long. Braking by electric motors acting as generators under belt load; also mechanical brakes. System includes drive-over hopper loading station for scraper discharge, screening and crushing plant, three drive-under terminal bins with total capacity of 1500 cu. yds.



SHOVELS AND CRANES

2—Model 150B Bucyrus Erie 6 cu. yd. Electric Shovels and Draglines (Note: 8 cu. yd. Dippers w/handles available for above); 1—Model 120B Bucyrus Erie 5 cu. yd. Electric Shovel and Dragline; 1—Model 38B Bucyrus Erie 1½ cu. yd. Shovel, Dragline, Backhoe, diesel; 1—Model 22B Bucyrus Erie ¾ cu. yd. Shovel, Dragline, Backhoe, diesel.

MOTOR PATROLS

9—Model 12 Caterpillar Motor Patrols, 8T, 80D, 70, and 71D Series.

HAULING UNITS

8—Model LRVX Mack Tractors w/Model 137W Euclid 30 cu. yd. Bottom Dump Trailers powered by NVH-12-B1 Cummins Engines; 10—Model PH95AC International Payhauler Tractors w/Model PW20 30 cu. yd. Athey Bottom Dump Trailers.

END DUMP EUCLIDS

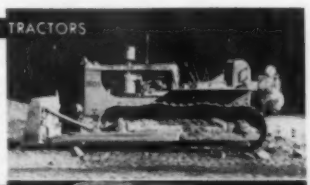
5—Model 46TD Euclid End Dump Units, 15 cu. yd., powered by Model NHRBIS Cummins Engines; 10—Model 63TD Euclid End Dump Units, 15 cu. yd., powered by Model 6-110 GMC Engines.

LOADERS

1—Model 175ADS Michigan 3 cu. yd. loader powered by Model 135DKBS Waukesha Engine; 1—Model D4 Caterpillar Loader w/Model EA4 Trackson Loader.

CRAWLER TRACTORS

15—Model D9 Caterpillar Tractors w/P.C.U.'s and Dozers, 18A Series (Note: 4—Ateco Hydraulic Rippers available for above); 21—Model D8 Caterpillar Tractors w/P.C.U.'s and Dozers, 14A Series (Note: 6—Caterpillar #8 Hydraulic Rippers available for above).



RUBBER TIRED TRACTORS

30—Model DW20 Caterpillar Tractors w/Model 456P Modified Scrapers, 67C and 88E Series; 10—Model DW20 Caterpillar Tractors w/Model PW20 Athey Wagons, 88E Series; 2—Model 33LDT Euclid Tractors w/Model 32SH Scrapers.

QUARRY DRILLS

1—Model TWM2A Joy Quarry Drill w/T500 Drills, pneu. tires; 3—Model TWM-5 Joy Quarry Drills w/T500 Drills, pneu. tires.

SPRINKLER TRUCKS

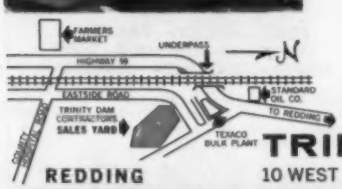
1—3400 gal. Model CF523C6 Kenworth powered by Model NRT6B1 Cummins Engine; 1—3400 gal. Model R1F402 International powered by Model NHB Cummins Engine; 1—3600 gal. Model RDF192A International powered by Model JBS600 Cummins Engine; 2—6000 gal. Model 46TD Euclid powered by Model NHRBIS Cummins Engine.

DUMPCRETE

5—4 yd. Dumpcretes mounted on International truck.

ALSO:

AIR COMPRESSORS • PUMPCRETE MACHINES • BATTERY LOCOMOTIVES • TRUCKS • PICKUPS AND JEEPS • WELDERS • LIGHT PLANTS • HOUSE TRAILERS • PUMPS • AIR TOOLS • ELECTRIC TOOLS • HOSE • PIPE • TANKS AND OTHER EQUIPMENT



All equipment kept in peak condition by elaborate preventive maintenance program. Choose from vast inventory while selection is complete. WRITE, WIRE OR PHONE FOR SALE PRICES OR TO ARRANGE A VISIT TO SALES YARD!

TRINITY DAM CONTRACTORS A JOINT VENTURE

10 WEST ORANGE AVENUE • SOUTH SAN FRANCISCO, CALIF. • PLAZA 6-0300, EXTENSION 279

SALES YARD • REDDING, CALIFORNIA Eastside Road at South end of Redding Phone: CHestnut 1-5241

A tractor pulls the Kolman 101 free as the crew prepares to move from one pit to another. The unit is designed for ease of movement. Note how the single-deck screen folds under for transporation.

Model 101 Speeds Movement of Borrow for Railroad Relocation in Washington Dam Project

Rigid sanitary, turbidity and time requirements did not prevent contractors from completing work on schedule for the relocating of 14 miles of Northern Pacific main line in preliminary work on the Howard A. Hanson Dam flood-control project on the Green River in western Washington.

Part of the credit goes to the hard-working Kolman Model 101 Conveyor-Screen plant. The Kolman conveyor was operated in a series of pits moving large quantities of borrow.

In the pits, as many as five Cat DS dozers brought material to a slot where a D9 with a U-dozer fed the conveyor dozer trap. A fleet of rubber-tired scrapers, which were loaded at a rate of one per minute, hauled the material to the big fills, some as high as 110 feet.

In a later stage, the conveyor was fitted with a 10-inch grizzly and a 9'x54" vibrating screen with 3"-square openings to produce subballast for the track.

Kolman offers a choice of single, double or triple-deck screens up to 5'x12' on the Model 101. Belt widths of 18" to 48" in lengths up to 60 feet.

Write for Literature and Prices

KOLMAN MANUFACTURING CO.
5200 West 12th St. Sioux Falls, S. D.

'56 Diamond T Dump — Gar Wood 5-7 yd. body, New Engine, 2 speed rear.

DIESEL TRACTORS

GMC, Mack International C.O.E., Sleepers and Conventional

'57 Ford — 1 ton pick up

GAS TRACTORS FOR LOW BEDS —

750 GMC; KB11 International; '51 Brockway, excellent engine

'56 International chassis and cab for 14' body — reinforced frame—new 8.25x 20 tires.

GENERAL MOTORS CORPORATION
103 N. Beacon St.
BOSTON, MASS.
STadium 2-2900

FOR SALE

F.O.B. MEMPHIS, TENNESSEE

1—Parsons Model 88-1B Trenchmobile, Serial No. 2685, 5 ft. max. boom depth	$ 3,000.00
1—Parsons Model 221-2A Trenchliner, Serial No. 2552, with D-315 Caterpillar Engine, equipped with 36" side cutter bars for 24" buckets, 4' conveyor extension & 10' boom extension	8,500.00
1—VULCAN No. 0 Single Acting - Air or Steam Hammer. New condition and plain type driving head for No. 0 Hammers and 18" square concrete pile, Serial No. 4331	11,000.00
1—Lima Model 603 Dragline, Serial No. 1463. 60' boom, 6WAL Waukesha Gas engine, 24" shoes x 13' tracks	14,500.00
1—Blaw-Knox Road Widener, Serial No. 955053, Continental F-226 Engine, 8:25 x 20 Rear Tires, All in excellent condition	10,000.00
1—Galion Trench Roller, Serial No. 35187. New Condition	4,250.00

Hawkins Equipment Co.
1475 Thomas St. - P. O. Box 4695
MEMPHIS 7, TENNESSEE

NEED EQUIPMENT?

"WE HAVE IT"

USED CONSTRUCTION EQUIPMENT

ALL MAKES AND TYPES

WESTPORT MACHINERY CO.
1801 Cherry Hill Road Baltimore 30, Md.
Phone: MUlberry 5-0402
W. F. Rippel, President Home Phone HO 7-9931

Foreign Contracts Notice to Bidders

We are seeking a
Joint Venture Contractor ASSOCIATE
for GOOD Money Making Foreign Projects

ROADS—BRIDGES—RAILROADS
MUNICIPAL—HARBOUR—DAMS
POWER—IRRIGATION—INDUSTRIAL

Must have late model equipment in good condition and AA-1 Dun & Bradstreet Rating, small Capital requirements. We have the GOOD concerns.

JACQUES J. YARED & COMPANY
P. O. Box 722 Station "B"
Montreal, Quebec

FORMGRADER

Cleveland Formgrader 180148 (180X-48). Used on one job only —excellent condition—ready to go to work. Price $3,500.00

Constructors Equipment Corp.
345 N. 57th St. Phila. Pa.
SH 8-4475

FOR SALE

3 Late LeTourneau Model B Scrapers, New Condition $19,500 each. Will consider trade in. Durabilt Const. Co., 7015 Bellevue Blvd. Omaha 47, Nebr.

EQUIPMENT FOR SALE

CHECK THESE PRICES

SIMPLICITY, Model S-100-45-3, 6000# pug mill, S/N 7803 with Dust Collector 10'x30' dryer, 4'x12' Symons screen, S/N N-48422, 37" Clarage type IE fan, S/N 1093-C, Gardner-Denver heater and fuel oil pump, S/N 124225 2 International UD-24 power units, S/N UDE-2022 and UDE-2521, International UD-18A, S/N UD-25406, Lucey Locomotive type 104 HP boiler, (2) 10,000 gallon and steam jacketed piping—Chenoyville, La. $22,500.00

85 KW KATO type 5157 generator set, S/N 26910-196 KVA., 230/440 volt, 279/139 amp, 1800 RPM, 60 cyc. 3 phase, with G.M. 671-RC-13 engine, S/N 6A-41271. Located at Dalworth Mach. Co.—Dallas, Tex. $3,000.00
ATHEY Model 125 Force Feed Loader, S/N 111, with 6 cyl. Ford engine. Located at Dalworth Machinery Company—Dallas, Tex. 5,000.00

ATHEY Model 125 Force Feed Loader, S/N 111, with 6 cyl. Ford engine. Located at Dalworth Machinery Company—Dallas, Tex. $5,000.00

KOEHRING 605 Crane, S/N C-8957, w/Cat. D-13000A engine, S/N 48-13367, w/2000 watt Kohler light plant—Amarillo, Tex. 27,500.00

BARBER-GREENE 24"x30' Port. Conveyor S/N 363-1156 on swivel wheel truck—Amarillo, Tex. 2,200.00

30"x30' 8" Channel Conveyor from plant above to hopper w/10 HP Motor—Amarillo Tex. 1,750.00

KOLMAN Model 101 Channel 36"x50' portable Conveyor S/N 58-1-36-50, w/25 HP Motor and 36"x50" Kolman Buzzer ScreenAmarillo, Tex 7,000.00

FERGUSON 5-8 ton Tandem Steel Wheel Roller, S/N 58170 w/Continental FA 162 engine, S/N 27644—Amarillo, Tex. 3,500.00

LeTOURNEAU Ripper on 2 steel wheels—Amarillo, Tex. $1,500.00

30"x30' Job made 8" Channel Conveyor w/7½ HP Motor for above Scalping Plant—Amarillo, Tex. 1,750.00

UNIVERSAL 24" dia. x 20" wide, type H-02-NC Hammermill S/N H-6 h/75 HP Westinghouse Motor Falk reducer—Kenner, La. 2,500.00

CEDARAPIDS type CGC, 30 ton per hour Gradation Control Unit, S/N 16610 with Cold elevator, Cedarapids horizontal vibrating screen, Continental Y-112 engine —Kenner, La 1,500.00

(2) Skid mounted (12"x18"x22' I-beams) York Ammonia refrigeration units complete with the following each: 40 HP York model D-8 compressor S/Ns 282103 and 282110, with 40 HP Motors; York Chiller; (2) York 16" dia x 16' long compressor tanks; 1½ elect. water pump; extra Haven Model 33-40 40" fan cooling tower for each rig. 40 Ton Located at Dalworth Machinery Company—Dallas, Tex. ..... ea. 7,500.00

INTERNATIONAL PH-65, 12 C. Y. "Payhaulier", S/N 679 w/Cummins NT-6-BI, S/N 180588. Purchased new in June 1958, located at Dalworth Machinery Company—Dallas, Tex. 20,000.00

94KVA Crocker Wheeler, Model 52-8-4 Generator Set, S/N 1105721, w/1.5 KW exciter,G.M. engine 6045A. 6 cyl. S/N 6-12824. Located at Dalworth Machinery Company—Dallas, Tex 5,000.00

ATECO Ripper, Model HR TO-24 (for TD-24 Intnl.) S/N 8728—one shank. Located at Dalworth Machinery Company—Dallas Tex. 3,000.00

105 Cu. Ft. Ingersol-Rand Model 105C Air Compressor, Serial No. 1504, with F 162 Continental Engine, S/N F 147983—Amarillo, Tex. 1,500.00

30-325 Amp. 40V. P&H Model WN250 Arc Welder on 2 wheel, S/N 30609, with Waukesha Model 180GLS engine, S/N 1012027—Amarillo, Tex. 400.00

300 Amp, 40V, Lincoln Code 3545, Arc Welder, S/N A-378823 on 4 wheels, w/F-244 Contnl engine, S/N 204-4734—Amarillo, Tex. 800.00

LeTOURNEAU Model A "Tournacrane", S/N C-4116-A-A pulled by LeTourneau Model C-1 tractor, S/N C3T-4250-C1-G, w/HBID Cummins engine S/N 17667—Amarillo, Tex. 7,500.00

Model 5S General 20-25' Concrete Screed Finish, S/N B 2545 w/Continental Y 112 engine S/N 55706—Purchased new in July 1956—Coldwater, Miss... 6,500.00

Model LF2A KOEHRING 25' Concrete Bullfloat, S/N LF-1534, w/AEH Wisconsin engine—purchased new in July 1956—Amarillo, Tex. 3,500.00

12" KOEHRING Concrete Bullfloat, S/N LF1189, w/Model AEH Wisconsin engine—Amarillo, Tex..... 2,000.00

Job built 25' Concrete Gang Vibrator machine with 12 vibrators harness and 15 KW Generator Set, w/extra vibrator dicks—Amarillo, Tex. 6,000.00

FERGUSON Model AHH Planer, S/N 125 w/Wisconsin Model AHH engine—Amarillo, Tex 4,000.00

34E KOEHRING Paver, S/N 18382 with 471RC63 G. M. engine, S/N 4A-20537—Ruston, La. 19,000.00

LeTOURNEAU "D" Roadster S/N GT 8797DRV w/G. M. Model 4055D engine, S/N 4A-39992—Coldwater, Miss. 6,500.00

BUCYRUS-ERIE Tractor drawn Model S-112 Scraper, S/N 52409—Amarillo, Tex. 3,000.00

CATERPILLAR D-8 Tractor, S/N 2U-6375 with No. 25 cable control, S/N 9D-7856, and 8S dozer S/N 8A-2198 —Amarillo, Tex. 7,500.00

CEDARAPIDS 40x33 Hammermill, S/N 20562, purchased new in Sept. 1958. Located at Conley-Lout Machinery Co. —Dallas, Tex. 6,000.00

7,000 to 8,000 LF of 22"x24"—10' long Rex Dual Duty Airport Forms. Purchased new in April, 1958. As is, where is, $6.00 per LF or lump sum—Amarillo, Tex. 45,000.00

(2) 30"x5' Horizontal material feeders w/8 yard hoppers —Amarillo Tex. ..... each $50.00

Sand Tunnel—330' long, 224' of 8 gauge multiplate (ELL 96x108) with 18 hoppers—Amarillo, Tex. 16,450.00

Note: (3) Syntron "Vibra Flow" Feeders available for use with this funnel @ $1,000.00 each
Gravel Tunnel—231' long—115' of multi-plate with 15 material hoppers—Amarillo, Tex. 9,500.00
24"x315' 6" Channel Tunnel Conveyor for above Gravel Tunnel w/15 HP Motor—Amarillo, Tex. 5,160.00

Double 30" included Lattice Conveyor with (2) 195' conveyors over and under w/(2) 50 HP Motors. One new belt installed in July 1959 and used 4 months. 4 Motorized pulleys available for use with this at extra cost—30, 30, 40 and 50 HP—Amarillo, Tex. .. 14,200.00

36" Straub "Kue Ken" Gyratory Cone Crusher, coarse bowl, S/N 14636-9, w/60 HP Century Motor—Amarillo, Tex. 10 700.00

24"x145' Job made 8" Channel Conveyor w/20 HP Motor—Amarillo, Tex. 3,000.00

36"x18' Job made 10" Channel Conveyor w/10 HP Motor—Amarillo, Tex 2,200.00

30"x25" Job Made Channel Conveyor w/10 HP Motor —Amarillo, Tex. 1,400.00

30"x42' Job Made 10" Channel Conveyor w/7.5 HP Motor—Amarillo, Tex. 1,400.00

6'x16' Simplicity 3 deck Model DR Horiz. Vibrating Screen, S/N 3616-DR-1150-S w/30 HP Motor—Amarillo, Tex. 7,000.00

36" Straub "Kue-Ken" Gyratory Cone Crusher, Medium Bowl, S/N 14536-9, w/75 HP Motor—Kenner, La. 10,700.00

KOEHRING Model LF-2A, 30 24' Concrete Bullfloat S/N 1395 w/Wisconsin AEH engine—Sherman, Tex. 3,500.00

(2) Model AG Stow portable concrete vibrators, w/Model ACN Wisconsin engines—Amarillo, Tex. ....each 300.00

NORTHWEST Shovel Attachment for Model 6 Northwest Crane w/extra AMSCO bucket—Amarillo, Tex... 4,500.00

One BARBER-GREENE Bituminous Mix Plant complete consisting of: Model 848 normal duty mixer w/8' steam jacketed pug mill; 18'3" Model 880 Hot Elevator, Fines hopper and feeder, Model 866 Gradation Control Unit; 27'6" Model 880 Hot Elevator; Model 837 single 7'x 20' drum dryer; Model 851 Dual Cyclone Dust Collector, and twin 23" Clarage Fans. Plant complete w/electric motors—New Iberia, La. 32,500.00

Model 95 Diamond Iron Works Crushing Plant complete with Model 24 Primary unit consisting of: 24"x36" Jaw Crusher, 3-30" Lattice Conveyors, w/Caterpillar RD-8 engine; and secondary unit with: 40"x22" Roll Crusher, 4'x12' vibrating screen, and 2½ CY screen hopper mounted on truck frame—Amarillo, Tex. 25,000.00

HELTZEL type 11, Model 200, 200 Ton Batching Plant w/3—50 Ton Agg. and 1—230 Bbl. Cement Compartments, S/N W-2295, purchased new in August, 1958—Completed one job since purchase—Sherman, Tex. 22,000.00

W. E. GRACE. 2-Car, Model 43, Rapid Fire Tank Car Heater, S/N 180, w/LeRoi Model D-140 engine—Sherman, Tex. 1,900.00

P. O. Box 531
RUSTON, LOUISIANA
Phone AL 5-0620

T. L. JAMES & COMPANY, INC.

P. O. Drawer 8
KENNER, LOUISIANA
Phone 4-2511

TENT POLES

Upright Type, Solid Wood (Fir), Natural Color. Octagonal Shape, 1¾" dia., Overall dimension approx. 61", wood to metal cap 54½", metal cap 2½", metal spindle 4". Stored at Syracuse, N. Y. and Utica, N. Y. Yards. In quantity lots, loaded your truck. Original Cost New 91¢. Our price 13¢.

Pelnik Wrecking Co., Inc.
YORKVILLE, N. Y.
Phone Utica RE 6-4621

TRAILMOBILE TRAILERS

4 Model ID-66
15 cu. yd. Rear Dumps—1958
FORD - TRACTORS
2 Model F-800

Write or call for photographs or units can be seen at

WEST SAND AND GRAVEL CO., INC.
2801 Rady Street
Richmond, Virginia Milton 4-3001

PIPE

All sizes - 2" thru 72"
All Gauges - .063" to 2.5"
Threaded & Collared
Plain End Beveled

PILING-OIL LINES-GAS LINES
WATER WELL CASING
WATER LINES

Fast Delivery by Truck or Rail from Eastern Stock.

STEEL CONCRETE BLOCK PALLETS

Flat-Deburred-Squared Edges
Stress Relieved-High Tensile

STEEL PLATE & SHEET SHEARED TO YOUR REQUIREMENTS

VALLEY STEEL
George Barber, Sales Mgr.
HAmilton 8-1301 - Dallas, Tex.
5901 S. Lamar

DRAGLINE

1—P&H Model 870, 4 yd. Dragline. 90' boom, completely overhauled.

BOYER & VINOVERSKI, INC.
7015 Locust Rd., Bethel Park, Pa.
Tel. Tennyson 5-4844

DRAGLINE-BACKHOE COMBINATION

Wayne Model #66
Gas engine, long and wide Crawler, rebuilt.

DRAGLINE

Bay City Model #45
Gas engine, long and wide Crawler, rebuilt.

BACKHOE

Osgood Model #200
Diesel engine, long & wide Crawler, rebuilt.

DRAGLINE

General Model #307
Diesel engine, long & wide Crawler, fair condition.

Additional Information & Pictures Available upon Request

Geo. G. Anderson & Co. Incorporated
14800 Myrtle
Harvey, Illinois
WAterfall 8-5512—Chicago
EDison 3-0222—Harvey

USED EQUIPMENT

1—Used Euclid TC12 with straight dozer 410 H.P. Allison Transmission in excellent condition. Priced for quick sale.

"Two (2) Used Euclid 14 TDT Scrapers, 15 to 20 yards capacity, etc."

We will promptly acknowledge all inquiries
Financing Available

MINNESOTA BRANCH EUCLID DIVISION OF GM
3305 Republic Ave.
MINNEAPOLIS 26, MINN.
WEst 9-2646

CUT YOUR COSTS & INCREASE PRODUCTION

Buy ADMAC Quality Used Equipment

CEDARAPIDS JUNIOR TANDEM PORTABLE CRUSHING PLANT, w/ 10 x 36 jaws, 24 x 16 rolls, 3 x 10 DD Screen, 24 in. feeder and charging hopper, 24 in. delivery conveyor, feed conveyor, mtd. on 9:00 x 20 tires, w/ air brakes, Int. Diesel Power.

CEDARAPIDS TRI-TANDEM PORTABLE CRUSHING PLANT, w/ 18 x 30 jaws, 30 x 18 rolls, 42 in. x 10 ft.—2½ deck screen, 30 in. ix 40 ft. field conveyor, Cat D-337 Power, mtd. on 10:00 x 20 tires, w/air brakes.

LIPPMANN PORTABLE ROCK OR GRAVEL CRUSHING PLANT, w/ 18 x 36 jaws, 3026 rolls, 4 ft. x 10 ft. screen and 3 ft. x 6 ft. screen, G.M. 6-110 diesel power.

WISCONSIN FOUNDRY PORTABLE CRUSHING PLANT, w/ 10 x 36 jaws, 30 x 18 rolls, 4 x 10 double deck screen, 24 inch delivery conveyor, charging hopper and feeder, elevating return wheel, sand conveyor, powered w/ G.M. 6-110 diesel power unit, mtd. on rear dual tandems, w/ front dolly.

UNIVERSAL SECONDARY DUAL ROLL CRUSHING PLANT, 40 x 24 rolls, 4' x 10' 2 deck Cedarapids screen, elevating wheel return, powered w/ Murphy ME-66 diesel engine, mtd. on 8:25 x 20 tires, w/ dolly.

EUCLID MODEL TC-12 TRACTOR, w/ twin GM Diesel engines, w/ push plate.

4—EUCLID MODEL S-18 SCRAPERS, powered w/ General Motors diesel power, 18-21 yd. capacity.

EUCLID MODEL S-7 SCRAPER, powered w/ G.M. Diesel, 7-9 yd. capacity.

ALLIS-CHALMERS HD-19 TRACTOR, w/ General Motors Diesel power, w/ cable controlled dozer blade w/ built in push plate.

INTERNATIONAL HARVESTER MODEL TD-24 TRACTOR, w/ I.H.C. dozer blade, w/ built in push plate and D.D. Cable Control Unit.

2—BARBER-GREENE ASPHALT FINISHERS, Model 879-A, powered w/ Le Roi gas engines.

ROCK DRILL PORTABLE W/ TWO CLEVELAND JUMBO ROCK DRILLS for vertical or horizontal drilling, w/ 600 cu. ft. Le Roi Compressor mtd. on International TD-24 crawler tractor.

ADAMS MACHINERY, INC.

2016 W. Cornell, Milwaukee, Wis.—HIlltop 4-7400

EAU CLAIRE—TEmple 2-2895 GREEN BAY—HEmlock 7-8791

FOR SALE

Three Model 2LD Euclid Rear Dumpers. $2,000 each or all three for $5,000.

One Model 2FD Euclid Rear Dumper, 15 Ton. Rebuilt, $7,500.

One Model 2FD Euclid 15 Ton Rear Dumper. Good Condition, $6,000.

Three 27FD Euclid 15 Ton Rear Dumpers. All excellent condition and guaranteed. $8,500 each.

One Model 20KW Sheppard Diesel Generator Set, 220/440V., 3 phase, 60 cycle. Rebuilt and guaranteed $20,000.

One 1020 Unit Trench hoe ¾ yard capacity. Powered by G-M Diesel Engine. In running condition but needs some work. $2,500.

One 656F Case Tractor with Loader and Scarifier. 1 cu. yd. capacity. Good condition. $6,000.

Three TC-12 Euclid Tractors with dozer blades. All rebuilt. From $37,500 to $42,500.

One Model TS-1622 Easton Rear Dump Body. 16 yd. capacity. Has adapter kit for attaching to Model S-12 Tractor. Excellent condition. $7,990.

STANDARD EQUIPMENT CO.

Phone: BUtler 8-1426

340-344 Pierce St. Kingston, Pa.

FOR SALE

1—Bros Rubber Tired Roll-O-Factor Model 450 S/N GPR-3217; Max. load: 100,000 lb.; Tires: 4-1800 x 25 40 ply; Air Press., Max.: 150 PSI. CONDITION—LIKE NEW.....$7,000.00

1—D-9 Cat. Tractor, Torque Converter Drive S/N 19A1287; #29 Cable Control; #95 Bulldozer; Push Cup. CONDITION—GOOD. $38,500.00

1—D-9 Tractor Torque Converter Drive S/N 19A1603; #30 Front Mounted Single Drum Cable Control; #50 Rear Mounted Dual Valve Hydraulic Control; #91 Cable Operated Straight Blade; Push Cup; Crutcher-Rolfs-Cummings Kelley Model D9 Ripper; 3½" x 14" x 97" Tooth. CONDITION—GOOD $48,000.00

1—Cleveland Trencher, Wheel Type Model 140 S/N 5944; International Diesel Engine. CONDITION —EXCELLENT $12,000.00

1—P&H Crane, ¾ yd. Model 255A S/N 16326; 50' Crane Boom; 30' Boom Backstop; Dragline Attachment: Engine: GMC Diesel, Model: 4055-D, 4 cyl. CONDITION—GOOD.....$14,000.00

4—Kohler Light Plants 5,000 Watts, Model #224-4M. Steel sled mounted, 20' Tower - Cluster of 4 - 1000 Watt Lamps. CONDITION—EXCELLENT.....$1,200.00 Each

FRYSINGER CONSTRUCTION CO.

3770 NORTH HIGH STREET

COLUMBUS 14, OHIO

Ph. AM 7-1283

We do a Nation Wide business in

STEEL SHEET PILING

FOR SALE OR RENT

80 pcs.	48 ft.	Z-32	Missouri
213 pcs.	60 ft.	MP-118	Illinois
180 pcs.	550-60 ft.	MP-115	Tennessee
218 pcs.	50-68 ft.	DP-2	New York
682 pcs.	45 ft.	MP-101	Indiana
473 pcs.	30 ft.	AP-3	Maryland
168 pcs.	25 ft.	DP-2	Penna.
280 pcs.	20 ft.	MP-112	Kansas

Storage yards at Buffalo - Baltimore - New Orleans - Memphis - Chicago
Also - H Bearing Pile

McKiernan - Terry and Vulcan Pile Hammers and Extractors - Construction and Railroad Equipment.

We are as close as your telephone—you can obtain Steel Sheet PILING BY DIALING CHestnut 1-4474, St. Louis, Mo. COLLECT

MISSISSIPPI VALLEY EQUIPMENT CO.

Rider Railway Exchange Bldg.

St. Louis 1, Mo. CHestnut 1-4474

"BRUSH-UP" on BRUSHES

at DALLAS BRUSH!

Call "Mr. Van" — The Friendly Brush Man for NEW Specifications and New Low Prices.

Rotary Sweeper Broom Cores
Road Drag Leveler Brooms
Street Push Brooms

Brushes for Every Industrial Need

DALLAS BRUSH MANUFACTURING CO.

5108 Westmoreland FL 7-6581

N. S. VanDeventer, Owner

SHOVEL FRONTS

FOR SALE

EXCELLENT CONDITION

Koehring 304

Bucyrus-Erie 16B

American 1¼ yd.

Koehring 301 Shovel Front

Call or Write:

Sweeney Bros. Tractor Co.

1622 Main Ave. - Phone AD 23305

Fargo, North Dakota

SAVE ON QUALITY MACHINERY

Barber-Greene Model 705B Trencher on rubber tires. 5½" x 48" cut, fair condition.$1,985.00

Allis-Chalmers Model HD5B Tractor with towing winch and Baker Bulldozer. Front pump. Good condition $4,850.00

Chicago Pnumatic Air Compressor, 105 cu. ft. portable, on excellent rubber ....$ 975.00

Caterpillar Model D4 Tractor, 18" shoes and Hyster towing winch. Good cond., $3,675.00

GEORGE PARK TRACTOR CO.

3809 Broadway - Phone SH 6-4345

MACON, GEORGIA

Used Trailers

2 1954 Tandem axle 14 yd. Omaha Standard Center Dump
1 1956 Single axle 10 yd. Omaha Standard Center Dump
1 1957 Single axle 10 yd. Fruehauf Center Dump
1 1958 Tandem axle 40′ Fruehauf flat with removable grain sides

ROY F. DRAKE
BODY & EQUIPMENT CO.
BOX 475
Sioux Falls, S. Dak.
Phone ED 4-5825
Glen Wintersteen
or
Roy F. Drake

FOR SALE

Barber Greene Model 879A Asphalt Finisher Serial #879-2-42 ..... $3800.00

1700 Gal Etnyre Distributor Serial #D2676 Mounted on 1947 Auto Car Model C50-200 ..... $4500.00

Huber 8-10 Ton Tandem Roller Model T Serial #4357—Buda Gas Engine.. $2500.00

Seaman Pull type Pulvi Mixer Serial #MHD72-2237 with Waukesha 6MZR Gas Engine $1000.00

D17000 Power Unit mounted on 4 Wheels Enclosed Hood $3000.00

Apsco Stone Spreader—Model P-155 Serial #153 ..... $2500.00

All of the above Equipment in Good Condition.

ROAD EQUIPMENT COMPANY
3301 Ridgeway Avenue
Baltimore 15, Md.

FOR SALE

D-7 Dozer S/N 17A2618, new tracks and rails, engine recently overhauled, cable dozer with front-end power unit; excellent condition.

TD14A Dozer, A.N. TDF30994, tracks and rollers in fair condition, motor and final drives recently overhauled. Tractor in fair condition.

LeTourneau "Super C" Scraper, S/N C3T3123 Gov't surplus machine, used very little; like new condition.

Trailer Dump in excellent condition; good tires.

Cleaver-Brooks Circulating Tank Car Heater; S/N 170845; new pump; fair condition.

Cleaver-Brooks Tank Car Heater; fair condition.

This Equipment is priced to sell. Prices will be submitted on request.

KEMP CONSTRUCTION CO.
Box 83 - PA 6-2026
RUSSELLVILLE, KENTUCKY

FOR SALE or RENT

THREE Ingersoll-Rand Model DR-600 Rotary Air Compressors on 4 pneu.
Serial No. AR-20101—Used 414 hrs. Sale Price $15,900.00
Serial No. AR-18130—Used 717 hrs. 14,300.00
Serial No. AR-16036—Used 1800 hrs. 12,300.00

ONE Ingersoll-Rand Model DR-315 Rotary Air Compressor on 4 pneu. Serial No. DR-10285 —Used 2 Years. Excellent condition $7,500.00

TWO Ingersoll-Rand IKA-210 Reciprocators. AS IS, WHERE IS ..... ea. $1,000.00

ONE Ingersoll-Rand Model GR-85 Rotary Air Compressor on 2 pneu. Serial No. MR-17030. Used less than one year. Excellent condition $2,250.00

ONE Ingersoll-Rand CRAWL-IR Model CM2-D45 Drill. Serial No. 17304. Used three months. Excellent condition. Guaranteed .. $12,000.00

TWO Ingersoll-Rand Model FM2 Wagon Drills with X-71 Drifters. Serial Nos. 721169 and 731236. ..... ea. $2,200.00

ONE LeRoi Model 315 Reciprocator Compressor. AS IS, WHERE IS $1,500.00

ONE LeRoi Model 250 Diesel Compressor, Excellent Condition $3,000.00

ONE Schramm Model 210 with Int. Diesel Engine. Good Condition. Serial No. 316385 ..... $2,500.00

ONE Worthington Model 160, Serial No. 72428. Good Condition $1,100.00

ONE Jaeger Model 60, Serial No. C 2345. Good Condition $900.00

ONE Nelson Model 200, 2¼ Yd. Tractor Shovel, Serial No. 2E 231. (Used as Demonstrator only.) Continental Gas engine. Factory List $18,200.00 ..... SALE PRICE $15,000.00

ONE Pettibone-Mulliken Model 125A, Serial No. 765. (Used as Demonstrator Only.) Factory List $15,300.00 ..... SALE PRICE $13,500.00

ONE Used Shield-Bantam with Pullshovel attachment. Model T-35 mounted on Crane Carrier. 1958 Model. Excellent Condition $12,000.00

ONE NORTHWEST Model 25 Truck Crane (used) Serial No. 12406 mounted on Dart Carrier with 90 ft. Boom $21,000.00

ONE Northwest Model 25 Pullshovel mounted on 28" treads; 11'-11" Crawlers with Murphy Diesel engine. Serial No. 18265. Excellent Condition $19,000.00

ONE Northwest Model 6 Dragline Crane with 60 ft. Boom, mounted on 24" treads, standard crawlers, Serial No. 12777. Excellent Condition $18,000.00

For further information on any of the above equipment, Phone or Wire Collect

CENTRAL NEW YORK EQUIPMENT CO., Inc.
2136 Erie Boulevard, East — PHONE: GRanite 2-9169 — Syracuse, New York

FOR SALE

1—Manitowoc 2000B Crane 80' Boom.. $17,500.00
1—Lima 34 Shovel & Dragline 45, boom 4,000.00
1¼ yd. Williams Clam Shell Bucket
1—Ingersol Rand Comp. 600 cu. ft. 8,000.00
The above located at Fort Peck, Montana
1—Jeffrey Arewall Coal Saw, complete with motors & Gen. 8,000.00
1—Longyear 24" Diamond core drill gas power 2,750.00
1—Air motor auger 1,250.00
1—Ramsome 115 Mixer S.L.W. tank.... 500.00
The above located at Lake Andes, So. Dak.
2—Ingersol Rand Paving breaker (each) 200.00
1—Skill Saw & Black & Decker electric hammer (for both) 75.00
The above items located in Mpls.
Contact CHAS. H. HOGAN
at 8218 Bryant Ave., So. Mpls. 20, Minn.
Ph. TU. 1-2217

FOR SALE

Fleet—Earth Moving Equipment
All in Excellent Condition

3—Caterpillar Tractors—2U Series
1—Caterpillar Model 12 Grader
2—Euclid S-18 Motor Scrapers
3—Euclid SS-18 Motor Scrapers

For Further Information Contact

William A. Rupert Contracting Corp.
Mtd. #73, Walmore Road
Niagara Falls, New York

Telephone Republic 1-4121 or
Republic 1-4122

Used

STREET SWEEPERS

(3) Wayne 50's
(1) Guttersnipe
(1) Austin Western 40
(14) Elgin 81's
(4) Elgin Street Kings

In Various Condition
From $500 to $5,500

Casey & Dupuis Equipment Corp.
340 Pleasant St.
Watertown 72, Mass.
WA 4-7575

(2) EUCLID REAR DUMPS 91FD's

18 Ton With Sideboards.
Used Approx. 2000 Hours
$30,000.00 for the pair
Located My Yard.

AL. FISHEL CO.
JE 5-4482 - 1318 N. Vandeventer
ST. LOUIS, MISSOURI

THE "DAKOTA" CABLE DOZER

• • FOR • •

CATERPILLAR D7 - D6 | INTERNATIONAL TD18 - TD14 | ALLIS CHALMERS HD16 - HD15 - HD14 - HD10 - HD9

ANY ABOVE MODELS **$995.00**

BLADE: Height 41" Width 97"

TILTING BLADE Max. Adjustment 12"

EDGES: Reversible Cutting Edge, Hvy. Duty End Bits, Standard 4" Punching, Edges Available at Any Caterpillar Store

Heavy Duty Parallel Box Construction
Approximate Weight 3200 Lbs.
Available As Straight Dozer Only

Dozer Will Mount with Old Style Overhead Bar or Streamline Front Shroud

STREAMLINE SHROUD with Sheave Group
$350.00
THIS ITEM IS SOLD AS AN EXTRA AND DOES NOT COME WITH THE $995.00 DOZER ARRANGEMENT.

MFG. & GUARANTEED BY THE MAKERS OF THE FAMOUS
"Dakota" Hydraulic Dozer
FOR D4 - D9 - D2 - TD6 HD6 & 9 CLETRAC

Dakota Tractor & Equip Co.
BARDO, NORTH DAKOTA

MACK DUMPER

1959 Mack B61S Diesel Tamden — 10 Yd. Body — World Renown Mack Bogie — Low Mileage — Low Price — Like New

Also Many Other Good Buys

CALL OR WRITE—ART COOK

MACK TRUCK INC.

2203 W. Beaver | Phone EL 3-1066 JACKSONVILLE, FLORIDA | Nite CH 9-4592

MW
MAKE AN OFFER SPECIALS

INT'L TD-24 TRACTOR W/SUPERIOR SIDEBOOM, 55 tons capacity at 4' overhang, 6¾ tons capacity at 20' overhang. Excel. cond. Delivered new 1955. Used only 1000 hrs.

RANSOME 34E DUAL DRUM PAVER with Hercules HXE gas engine, power loader, boom and bucket. With spreading reach of 32½ ft., 60 gallon measuring tank, 800 gallon auxiliary tank with pump, power boom raising batch meters with counters and full length crawler mounting. Completely rebuilt and ready to work.

HOUGH HHG PAYLOADER—1¾ yd.—4 wheel drive, 7000 lb. carry capacity at 4 M.P.H. Used less than 500 hrs. Original rubber like new. Guaranteed.

Write for Complete List

M-W EQUIPMENT CO.

Division of Metalweldd, Inc.
Hunting Park Ave. & Fox Street
Philadelphia 29, Pa. BA 6-2600

VIBRO-PLUS VIBRATING ROLLER

MODEL CH-30
USED AS DEMONSTRATOR
Less Than 100 Hours

Can Compact 12" to 18" lifts, yet be pulled by a farm tractor. Drum with 58". Equipped with 25 H.P. diesel engine—New. Price $9,300.00.

Sale Price **$7,500**

Contractors Supply

620 East 18th Street
KANSAS CITY, MISSOURI

Unused PILE DRIVING OUTFITS

Less Than One-Half New Price

GOVT. SURPLUS FINEST QUALITY

with 20' leads, 2000# hammer $695.00
with 20' leads, 2500# hammer $895.00
with 30' leads, 2000# hammer $795.00
with 30' leads, 2500# hammer $995.00

COMPLETE WITH CAP. CATWALKS
F.O.B. Kansas City
Extra New 2000# Hammers $200.00 each

WENZEL MACHY. CO.
565 S. 10th St.
Kansas City, Kans.
Mayfair 1-1710

FOR SALE
Road Construction Equipment

1—Etnyre Oil Distributor, new in 1959, in first class condition. This distributor is mounted on a two-ton GMC truck which has just been completely overhauled. The tank holds 1,250 gallons and has a good power unit which was also new in 1959. Price—$5,500.00.

Model B 15 Browning, 13 wheel rollers. New in 1959, in first class condition. Price $1,200.00.

1—HD 10 AC Tractor with power unit, 1956 Model. Price $8,000.00.

1—Burch Gravel Spreader. New in 1959, in first class condition. Price $450.00.

3—#12 Motor Graders. Priced from $4,000.00 to $8,000.00.

1—Bros 13 wheel Pneumatic roller. In good condition. Price $1,100.

1—Cat DW 15. Price $14,000.00.

1—D2 Caterpillar Crawler. Price $1,500.00.

This equipment will be at

EVERETTS INC. SHOP
Jamestown, North Dakota
Phone CL 2-3831
Or Call Bill Hamann
Dickinson, North Dakota

FOR SALE

Complete Pioneer Sand & Gravel Plant, revolving screens. Eagle course material washer. Now producing aggregates to State of New Jersey standards $12,000.00

CLAREMONT MACHINERY, INC.
734 15th St. N.W. Tel. EX 3-0118
Washington, D. C.

Clearing House Ads Bring Results

USED CATERPILLAR EQUIPMENT

1—D-8 Pusher Series 15A
3—DW-15 Series
2—DW-10 With Number 15 Scrapers
3—DW-21 With Turbo Engines

SHREVEPORT EQUIPMENT COMPANY, INC.
P.O. Box 1532, Shreveport, Louisiana
Telephone: 3-8421

FOR SALE

BACKHOES

LIMA Model 34 w/Camel Back Backhoe - ¾ yd. Model HRC Cummins Diesel Engine. Excellent condition. 1958 machine used approximately eight months.
INSLEY Model K-12 - Power Chrysler Industrial Engine - Shovel Front and Crane Boom available. Rebuilt.

BULLDOZER

CATERPILLAR Model D6 with angle blade. 9U Series. Rebuilt.
ALLIS-CHALMERS Model HD9 w/GarWood hydraulic blade - 471 GM Diesel. 2900 actual hours.

CONCRETE MIXER

JAEGER - Model 3½ SNT, '56, excellent cond.

EARTH MOVER - SELF-PROPELLED

LeTOURNEAU - Two (2) Model "CR" Turnapulls, powered by 6 cylinder Cummins diesel Engines. 21:00 x 25 tires. Very good cond.

PUMPS

JAEGER Model 4P - 4" Centrifugal - powered by 4 cylinder Continental gas engine - mounted on two (2) steel wheels. Completely rebuilt.

ROLLERS

GALION 8-12 Ton Tandem - Powered by 6 cylinder Continental Gas - equipped with torque Converter and Sprinkling system. Approximately eighteen (18) months old and in excellent condition.

STONE SPREADER

JAEGER - Model SPS-1C mounted on crawlers - powered by 6 cylinder Continental gas. Completely rebuilt.

All The Above Equip. Priced for Quick Sale

CALL - WIRE - WRITE

W. F. Rippel

THE WESTPORT MACHINERY CO.

1801 Cherry Hill Rd., Baltimore 30, Md.
Phone MUlberry 5-0402

ROAD MATERIAL SPREADERS
WARREN SPREADER-PAVER

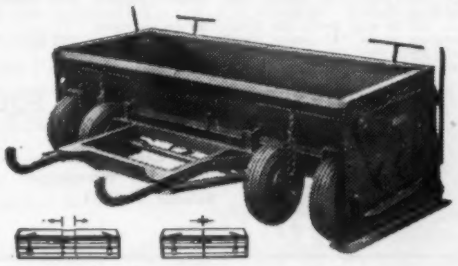
TELESCOPES 8' TO 12' IN WIDTH, 0-6" IN DEPTH

ALL PURPOSE

DESIGNED TO DO

A BETTER JOB

IN LESS TIME



Unique features enable units to be hitched to any dump truck with no hitches on truck required. Transported on the tail gate chains. The Warren Spreader-Paver is truly an all-purpose machine for hot mix and road base materials. It does an excellent job from road laying to small driveways. It is a real profit maker for both the small and large contractor.

Dealers — Representatives Inquire

WARREN MANUFACTURING CO.

P. O. BOX 413 — LEFFEL LANE & PENN. R.R.
SPRINGFIELD, OHIO

TRUCK MIXER – INVENTORY SALE

Smith 5 Yd.—6⅛ Yd., open end $1,500
Rex 6½ Yd. Adjusta-Wate $2,750
Rex 5 Yd.—6⅛ Yd., perfect shape $1,750

TRADED ON NEW REX MIXERS—REPAIRED—BLASTED—PAINTED.
18 Units in Our Yard—Terms.

EIGHMY EQUIPMENT COMPANY

Pierpont at W. State Street — WO 4-6706
ROCKFORD, ILLINOIS

LONGITUDINAL FINISHING MACHINE

Koehring Float Finisher - Serial No. LF984. Used on only one job - excellent condition - ready to go to work. Price $3,500.00.

Constructors Equipment Corp.

345 N. 57th Street — Phila., Pa
SH 8-4475

HEADQUARTERS FOR USED ASPHALT PLANTS, ETC.—BATCH & CONTINUOUS MIX. Among them—Madsen 4000#, Cummer 4000# complete outfit. Most modern Hetherington Berner, G-60 Cedar Rapids, Barber Greene #840-#842-#845. Most modern, complete, Cedar Rapids 180 TPH, Wylie 15-20 TPH hot mix, on rubber. DRYERS—#832 Barber Greene 1958 size 52" x 16', HB 5' x 24', Cummer 66# x 28', Simplicity 135 TPH. 54" x 24'. Simplicity dryer shell on frame—$700.

ASPHALT EQUIPMENT SALES COMPANY
319 North Gibson Avenue,
Indianapolis 19, Indiana
Telephones—
Fleetwood 7-7738 - Fleetwood 6-2474
Neal H. Daw, manager

BARGAIN

DUSTEX DUST COLLECTOR

Used only part of a season

Write Box 1231, Roads & Streets
22 W. Maple St., Chicago 10, Ill.

WANTED

1¼ OR 1½ YD.

BACKHOE

WILLIAM H. DOUGLAS, INC.
P.O. Box 398, Topeka, Kan.

Lowboy Tractors and Dumps

'56 IHC RF195 tandem tractor with air brakes, 900x20 tires.
'50 Hendrickson tandem tractor with air, 2 spd aux and 10:00x20 tires.
'57 FWD diesel tandem, 4x6, 210-hp. engine, 10 spd, R. R.
'56 GMC, MW503, tandem dump, trans and engine overhauled.
'55 GMC, MW503, tandem dump, average condition. Good buy.
2 1957 Daybrook 4-5-yd. dumps. Like new condition. $500 each.
1955 T-800 Tandem Ford with 3 speed Aux.
1956 R195 Tandem Tractor with air.
'57 IHC ½-ton custom pickup, 3 spd with O. D. trans.
'55 GMC, DFW822, tandem diesel tractor, rebuilt motor. A-1 condition.
100 trucks—all makes and sizes.

McGEE TRUCKS, INC.

2535 University Ave. — St. Paul, Minn.
MIdway 6-7555

USED EQUIPMENT BUYS

2—A.C. HD-5G. Very good and priced right. Each	$ 7,950.00
1—A.C. TL-12. 1½ yd. Wheel drive. Excellent	8,650.00
1—LeT C Motor Grader, Serial #GM6T-2618-C7. Ready to work	12,950.00
1—Cat D-7, Serial #9G-4331-SP and LeT 8 yd. Scraper and PCU	3,960.00
1—Northwest Model 25. ¾ yd. Shovel, crane and dragline combination	7,950.00
1—OC-12 Oliver, Serial #2JX-120, 1 yd. Loader 2½ years old	4,950.00
1—A.C. HD-7 with Drott Tilting 10' Dozer	4,875.00
1—Cat D-7, Serial #7M-8647-SP and La Plante Choate and Dozer	7,950.00
1—A.C. HD-6G. Excellent condition	11,975.00
1—Cat D-4, Serial #7U-32759 with HT-4 Hydraulic Loader Semi Grouser Shoes	6,550.00
1—A.C. HD-15GC, 3 yd. Loader with Torque Convertor, New Tracks, New Tip-Back Bucket. Excellent	19,990.00
1—A.C. HD-5B with Drott Tilt Dozer. 90 day warranty	7,975.00
1—Gunnison Model "A" Senior Distributor, 1,000 gallon. 250 GPM Pump and fully adjustable	495.00
1—I.H. TD-6. 61 series. Serial #41497—575 hours. Less than 1 year old	9,750.00

MOONEY TRACTOR AND EQUIPMENT CORPORATION

13566 W. Carmen Avenue
Milwaukee 18, Wisconsin
SUnset 1-4161

MADISON
CHerry 4-3051

EAU CLAIRE
TEmple 4-2779

5 1958 MODEL 421-S MACK TRUCKS 182½" WB 108" CA AIR BRAKES

- 401 Engine
- 20-C Quadruplex Transmission
- 32,000# Mack Bogie—6.45 ratio
- Mack 505 Front Axle
- Frame reinforcements
- 1000x20 tires—Approx. 50% tread
- Front & rear tow hooks
- 24,000 - 38,000 miles
- 50 gallon step tanks
- 12 Volt 30 Amp generator
- Directional signals
- Heater
- West Coast Mirrors
- Cab marker lights
- Front shock absorbers
- Painted Red

Priced at $5,750.00 Each

INTERNATIONAL HARVESTER CO.

3250 HARVESTER ROAD — FAirfax 1-7770

W. H. McPEAK
KANSAS CITY, KANSAS

FOR SALE

Two (2) Model T-70 Curtis-Wright Scrapers — 7½ Cu. Yd. Struck Capacity—side Boarded to 10 Yd.—Reconditioned in Our Shop—G.M. 4 Cyl. Diesel Rebuilt—Machines Repossessed—Priced Right—Rental 3 Months Minimum Acceptable—Purchase Option.

Call or Phone:

E. H. KLIEBENSTEIN COMPANY

Ridgefield, New Jersey — PHONE: Whitney 3-5533

3—10' x 78' Dryers—3054 Jaw Crusher
36" Merrick Weightometer—36" B.A.
Feeder 106' Long, 48" x 120" Feeder
Conveyor-Syntron Screen Conv. 24" x 31'
Syntron F66 Feeder—6' x 14' Vibrating feeders
60" x 300' & 150' Conv. 3020
Dixie Nonclog Moving plate Hammermills
Asphalt Plants-Hydrated Lime Plant.
2'3'4' Symons & Telsmith Cones, 66FC
Tel. Cone Part. 24" x 25' Eagle—sepl.
Fine Screw, others. Jaws-Cones-Gyratory-Roll dbl. Triple-Hammermills & Impactor crushers. Ball-Rod-Tube-Mills-Screening-Washing & Crushing Plants.
Classifiers-Compressors-Conveyors, Cranes-Drills-Dump Cars-Dredges-Feeders-Hoists-Motors-Generators-Kilns-Dryers-Locomotives-Pumps-Screens-Shovels-Draglines-Transformers-Euclid Trucks.

Equipment List sent on request.

Stanley B. Treyer Equipment Company
Box 97 — Phone 500 — Crosby, Minnesota

DRAGLINE MATS

Any Length, Width or
Built to Specifications

We build them a little better for a little less.

STRICTLY HARDWOOD.

Also LUMBER and PILING

Kent Piling Co., Inc.
CHARLES KENT, PRESIDENT
Phone Days: Amite 2641 - 2644 - Night 8454
FLUKER, LOUISIANA

CLEARING HOUSE ADS BRING RESULTS

FOR SALE

Rex Dual Drum Paver. Model 34-E, Serial No. GD340. Purchased New in 1957. Powered By GM 471 Diesel Engine. Paver Has 35-Foot Boom, A 600-Gallon Auxiliary Tank And Pump.

In Very Good Condition—Located At Norlina, N. C.

PRICE $21,500.00 F.O.B. CARS

Write, wire or phone

CENTRAL ENGINEERING & CONTRACTING CORP.

P. O. BOX 1131
PHONE 26191 — DURHAM, N. C.

TRUCKS WANTED

Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

BILL FISHEL
Vandeventer Auto Sales
717 So. Vandeventer — St. Louis 10, Mo.
Ph. FRanklin 1-1750

USED STEEL

BEAMS—8" to 36" WF, H & I
CASING-PIPE 12" to 10' Dia.
B.P.'S—PLATE—ANGLES
WANTED: YOUR SURPLUS STEEL

LEOPOLD COHEN IRON CO.
3000 S. Kedzie, Chicago 23, Ill.

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:
- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 — HUnter 6-4000
In Florida Call: Port Everglade Steel Co. Ft. Lauderdale—JA. 4-6845
In Houston Call: G. Oliver—GA. 4-7234

NEW and REBUILT GOV'T SURPLUS PARTS

on all Army Type Trucks—Jeeps.
Also civilian.
4 and 6 wheel drives.
SAVE up to 40%
Our Rebuilt Motors carry
NEW MOTOR GUARANTEE

SPECIAL: Brand New Complete
H X D ENGINES
Less Accessories. Gov't Cost $3,950.
Our Price Is a Steal. FOB K.C. Only
$695.00

Also Parts for STUDEBAKER WEASELS
Jeep Parts Catalogs for all Models to owners and dealers.
Inquiries Welcome . . . Fast Air Mail Replies.

AMERICAN AUTO PARTS Company, Inc.
1830 Locust St. Kansas City, Mo.
Dept. Rs, Phones BA 1-4232

CALL UPON *MUTUAL* FOR THE NATION'S LARGEST

PARTS STOCK

Headquarters All Heavy-duty Equipment, Supplies & Parts
• DUMP TRUCKS • LOADERS • CRANES • ENGINES
Lowest Prices - Complete Satisfaction Guaranteed

NEW and Guaranteed REBUILT ENGINES
Completely Dynamometer "Run-In" and Tested in our own modern extensive rebuilding shops.
• HERCULES • CUMMINS
• CONTINENTAL • WAUKESHA
• GMC DIESEL

2000 S. WABASH AVENUE
CHICAGO 16, ILLINOIS

25TH YEAR OF QUALITY SERVICE TO THE HEAVY EQUIPMENT INDUSTRY!

MUTUAL TRUCK PARTS Co., Inc.

Telephone: CAlumet 5-3500

BARGAINS

Link-Belt 1½ yard shovel, Cat Diesel D13000, Ready for your job.

P&H 20-Ton Model 255TC, 1948, 80′ Boom, 30′ jib.

¾ yd. P&H Backhoe, IHC power—from original owner—in top condition.

Dozer—IHC TD14A. Priced to Sell.

L820 Lorain Crawler, 2 yd. shovel, 60′ crane boom—from large contractor who really maintains equipment.

ESCHENHEIMER CORP.
240 N. Beacon St. Brighton, Mass.
ALgonquin 4-2262

PRICED FOR IMMEDIATE SALE

CONSTRUCTION EQUIPMENT IN EXCELLENT CONDITION

Michigan Model 175-A Front End Loader 2½ yard Bucket—Serial #2839
Tractor & Dozer Caterpillar Model D-9 Serial #19A 797
Tractor & Dozer Caterpillar Model D-9 Serial #19A 849
Tractor & Dozer Caterpillar Model D-8 Serial #14A 4529
Tractor & Dozer Allis-Chalmers Model H.D.-16 Serial #HD16-1071
Letourneau-Westinghouse Tournapull Model D Serial #60163
Scraper Model DM Serial #S90173
Buffalo-Springfield Kompactor Model K with Cat Diesel Engine Serial #28868
Shield Bantam Truck Crane & Backhoe Attachment Model 300

These machines may be seen and inspected at anytime at our Terminal Avenue, Clark, New Jersey Yard.

VILLA CONTRACTING CO., INC.
233 North Ave. Adams 2-4111 or Fulton 1-8442 Westfield, New Jersey

---

DIESEL TRACTORS

10—1955 & 1955 R.D. 205 Internationals with J. T. Cummins Engines with Tag Axles.

4—1954 R.F. 195 Tandems 175" wheel base with 8 to 10 yard dump bodies.

A. J. RHIAN
International Truck Dealer
Phone NO 5-2527
YANKTON, SOUTH DAKOTA

FOR SALE

TANDEM DUMP TRUCKS

3—1954 Mack B-30S Dumps
2—1939 Mack EH Dumps
1—1952 White WC 2264 Dumps
3—Mack EQ and EH Cab & Chassis
1—1951 Mack A 40 T Single Axle

The above trucks are in good condition and have been well maintained, and they are presently operating and can be inspected in the Dayton, Ohio area. Those listed as "Dumps" have new dump bodies in excellent condition.

Call BLACKBURN 1-1800 in Cincinnati, Ohio or call TROJAN 88631 in Fairburn, Ohio.

FOR SALE

DRAGLINES · SHOVELS · CRANES

All Makes and Models,
½ yd. to 35 yd.

EUCLIDS:
Rear, Bottom Dumps and Scrapers

"Other equipment available not listed above"

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Avenue Hazleton, Pa.
Gladstone 5-4041 5-0253

New Delaware Bridge Studies Will Start

Clearing the way for engineering studies and a feasibility report on a proposed second bridge over the Delaware River between Delaware and New Jersey, the Delaware River Memorial Bridge Commission adopted in principle an outline of the procedure to be followed by the engineering firm of Howard, Needles, Tammen and Bergendoff and authorized the firm to proceed with the studies.

The $148,000 cost of the studies for the new bridge will come from toll receipts on the present span.

CONCRETE TESTERS

The World's Finest Low-Cost Precision Testers

For
CYLINDERS
CUBES
BLOCKS
BEAMS
PIPE

IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 · NEW CASTLE, PA.
U.S.A.

. . . for more details circle 302 on enclosed return postal card

Manufacturers' Literature

Continued from page 194

CUTTING BLADES: A new line of precision designed diamond segmented circular saw blades for more effective wet cutting of concrete, sandstone and monofrax has been announced and presented in a brochure from Hoffman Bros. Drilling Co., Inc., Punxsutawney, Pa. Available in light, medium, medium-heavy and heavy diamond concentrations, the literature describes these blades as having diameters of from 8 to 37 in.

For more details circle 190 on Enclosed Return Postal Card.

MACHINE SELECTION: A new booklet just published by Caterpillar, Peoria, Ill., discusses and enlightens the subject of proper machine selections for soil and water conservation work.

The booklet goes into the use of scrapers, wheel tractors, motor graders and crawler-mounted tools. Entitled "From Plan to Profit", it discusses the upswing in conservation work: brush and trees to be cleared; dams constructed; and swamps to be reclaimed.

For more details circle 191 on Enclosed Return Postal Card.

EQUIPMENT SAFETY: A 25 min. film produced by the Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich., was recently released. Based on the hard facts of heavy construction life, the film was made with the cooperation of the National Safety Council. Titled "The Quota", it deals with accident prevention and with cumulative and far-reaching effects of construction equipment accidents.

For more details circle 192 on Enclosed Return Postal Card.

TRUCK HARDWARE: A new catalog of truck and trailer body hardware is now available from the Binkley Co., Warrenton, Mo. The pocketsize booklet, entitled "Binkley Hardware Handbook", contains 32 pgs. of parts such as hinges, pins and brackets, slam locks and the like. Listed are all dimensions, part numbers and specifications for each piece of hardware.

For more details circle 193 on Enclosed Return Postal Card.

MAINTENANCE CATALOG: A new cars-trucks-tractors maintenance catalog is now being distributed by Owatonna Tool Co., 417 Cedar St., Owatonna, Minn.

The 36 pg., catalog describes in detail a wide variety of special tools and hydraulically-operated maintenance equipment used to service trucks, tractors and construction equipment.

For more details circle 194 on Enclosed Return Postal Card.

THE PRESTRESSED CONCRETE Institute announced that special sessions for the producer members will be expanded during the coming 6th Annual Convention to be held Sept. 27-30 in the Hotel Statler Hilton, N. Y. Among the topics of particular concern to the producers are: extrusion; automation and mechanization; financial aspects of the prestressed business; and combination pre- and post-tensioning versus draped strand.

For more details circle 195 on Enclosed Return Postal Card.

GENERATING SYSTEMS: A new bulletin describing a complete line of engine-driven electrical generating systems in the range of 10 to 200 kw. is available from Consolidated Diesel Electrical Corp., Stamford, Conn. Included in the catalog is information about the uninterrupted power supply for critical applications where interruptions of only seconds can not be tolerated. Also featured are adverse environmental power units and an automatic positive power system.

For more details circle 196 on Enclosed Return Postal Card.

SHOVEL-CRANE: Just released from the Thew Shovel Co., Lorain, Ohio, is a 12 pg. catalog on the Lorain 50, a 25 ton, 1 yd. crawler mounted shovel-crane. The booklet gives details of construction including the Lorain "Joy Stick" controls. The machine is described as being easily converted to shovel, crane, hoe, clamshell or dragline.

For more details circle 197 on Enclosed Return Postal Card.

BITUMINOUS PAVERS: An informative folder covering the uses and advantages of their paver has been issued by the Iowa Mfg. Co., Cedar Rapids, Iowa. The folder explains the 18 speed transmission, the use of self-cleaning crawlers and the simplified controls.

For more details circle 198 on Enclosed Return Postal Card.

FASTENING TOOLS: Application Bulletins (A-Series) are published regularly by Hilti, 73 South Field, Stanford, Conn., illustrating how various fastening problems can be solved by the use of HILTI tools and fasteners. Engineering staff provides free consultant services on difficult projects and offers recommendations on procedures to be followed to obtain effective fastenings possible.

For more details circle 199 on Enclosed Return Postal Card.

SPREADER BROCHURE: Literature is available describing the K-5 S-C salt, sand and cinder spreader from the Baughman Mfg. Co., Jerseyville, Ill.

Designed to mount in the bed of a dump truck, it is said to have the same capacity and efficiency as chassis mounted body units, and frees the truck for other uses when the spreader is not needed. The unit can be used for chip spreading during summer months. Turnbuckles hold the body securely to the side of the dump bed when in use. If it is not needed the body can be removed in a matter of minutes, reports Baughman.

For more details circle 200 on Enclosed Return Postal Card.

CURB AND SIDEWALK FORMS: A new publication on the complete line of Rex curb, combination curb and gutter, sidewalk and flexible steel forms has been announced by Chain Belt Co., Milwaukee 1, Wis.

The bulletin presents detailed information on such features as: electro-welded, long-lasting stake pockets; workable face forms that are available in three different styles; and sliding dowel connections on face forms. The bulletin also carries suggested specifications for curb and gutter forms.

For more details circle 201 on Enclosed Return Postal Card.

TRAXCAVATOR: An eight page booklet just released by Caterpillar, Peoria, describes the new Caterpillar 977H Traxcavator. The new unit, according to the literature, features a new turbo-charged engine with horsepower of 150, a new power shift transmission which is coupled with a speed range selector to give four speeds in either forward or reverse, and a bucket capacity of 2½ cu. yds.

For more details circle 202 on Enclosed Return Postal Card.

THROTTLE VALVES: A 4 pg. bulletin that illustrates and describes the line of Le-Hi Series 2500 throttle control valves is available from Hose Accessories Co., 2720 N. 17th St., Philadelphia 32, Pa.

The valves are described as a safe control of compressed air on pneumatic operating equipment for contracting, construction and general industrial applications.

For more details circle 203 on Enclosed Return Postal Card.

SHORING FRAMES: A new four page bulletin describing the new 20K heavy duty "Trouble Saver" Shoring frames has been published by the Patent Scaffolding Co., 38-12 12th St., Long Island City, N. Y.

The product, reputed to be capable of sustaining loads up to 10,000 lbs. each leg, are fully described. The publication also gives details on the interchangeabilty of specially-designed U-heads, sprockets, adjustable legs and base plates.

For more details circle 204 on Enclosed Return Postal Card.

MOTO-CRANE: A new 12 pg. catalog covering the recently introduced 60 ton Moto-Crane Model MC-760 has been released by the Thew Shovel Co., Lorain, Ohio. One of the features discussed in the booklet is the "Power-Set" outriggers that are said to be set up in one minute. Each beam is described as being individually, hydraulically controlled from the carrier cab. Also described is the "Shear-Ball" connection, a ball bearing design which connects the turntable to the carrier.

For more details circle 205 on Enclosed Return Postal Card.

HOSE CLAMP: A new 6 pg. folder describes the Punch-Lok hose clamps, manufactured by Punch-Lok Co., 321 Justine St., Chicago 7, Ill. The clamps are said to be easy to use and are portable. Also covered are the TA-1 Tension-Air production clamping machines and the K-45 Clamp Master maintenance kit.

For more details circle 206 on Enclosed Return Postal Card.

DYNA-MIGHT Battery-Operated

instant up-and-down action

MONARCH

POWER HYDRAULIC CONTROLS

for snow plows

HY-LO-JACK

HY-LO FOR JEEP Fan-Belt Driven

One man controls the plow from the cab . . . instant up-and-down action with the flick of a wrist. Snow removal is easier, faster, more economical with Monarch. See your dealer. Write for illustrated folder.

MONARCH ROAD MACHINERY COMPANY

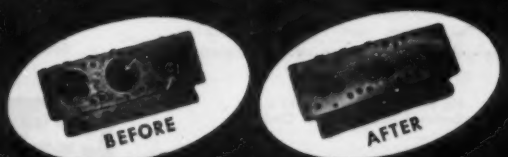
1331 Michigan St., N.E. Grand Rapids 3, Michigan

. . . for more details circle 330 on enclosed return postal card

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Swick-Guth Heads. Swick-Guth restores cracked or worn heads, blocks, transmission cases to a Guaranteed good as new condition by the Controlled Heat Process . . . successfully used for more than a Quarter Century.

GUARANTEED TO YOUR SATISFACTION



Send today for price list and a free booklet on the famous Swick-Guth Process, and the name of the dealer nearest you.

SWICK-GUTH CO.

McPHERSON KANSAS • FORMERLY GUTH CO.

"SPECIALISTS IN WELDING DIESEL CASTINGS"

. . . for more details circle 342 on enclosed return postal card

Manufacturers' Literature

STANDARD CATALOG: A new street and highway standard catalog has just been released by Pfaff and Kendall, 84 Foundry St., Newark, N. J. The new release is basically a working engineering specification brochure, which in 16 pgs. and over 20 drawings, covers complete and detailed data on the various lighting standards.

For more details circle 207 on Enclosed Return Postal Card.

CRANE: A new brochure covering specifications and applications of the Model 32 has been issued by Little Giant Crane & Shovel, Inc., Des Moines, Iowa. Clutches, cable drums and swing drums are illustrated with a descriptive narrative. A schematic line drawing shows the direct power train. The crawler base and upper machinery are shown in full view photographs.

For more details circle 208 on Enclosed Return Postal Card.

WELDING TRAINING AIDS: Fifty helpful welding training aids are listed and described in a new folder from Hobart Welding School, Troy, Ohio. The pamphlet lists books, charts and educational films. Welding codes and welding specifications are also included.

For more details circle 209 on Enclosed Return Postal Card.

KAISER INDUSTRIES: George Havas has been appointed vice-president and director of engineering of Kaiser Industries Corp., it was recently announced. Mr. Havas has been associated with various Kaiser industries since 1928.

For more details circle 210 on Enclosed Return Postal Card.

N.Y. TESTING LAB: A time-saving monthly service called the Nytl Laboratory Guide Report will become available for the first time this fall. Of basic interest to engineers and scientists, these reports are said to answer many typical problems encountered in laboratory procedures.

For more details circle 211 on Enclosed Return Postal Card.

CONSTRUCTION EQUIPMENT: A variety of information literature has been released by The Oliver Corporation, 400 W. Madison St., Chicago 6, Illinois. Informative and graphic, the publications deal with the firm's 4-plow 770 tractor; 2-3 plow model, 500 tractor; OC-96 and OC-96 crawler; all-purpose line of tractors; general-purpose tractors; spreaders and 3-point hitch mowers.

For more details circle 212 on Enclosed Return Postal Card.

BELT CONVEYORS: A new 20 page catalog describing the recently expanded "Redi-Fab" belt conveyor line has been issued by Barber-Greene Co., Aurora, Ill. The company states that it has now expanded to lengths ranging from 18 to 240 ft. and capable of capacities up to 480 tph. Also contained in the catalog is a breakdown of pre-engineered components in the Redi-Fab group, describing design and construction of each unit.

For more details circle 213 on Enclosed Return Postal Card.

MOTOR SELECTOR: Howell Electric Motors Co., Howell, Mich., has announced a new eight page catalog listing in brief, quick reference to the complete motor and generator line available through the consolidated Howell and Ohio Electric and others. AC motors manufactured by the combined group from 1/40 to 300 hp. Included are a complete line of standard motors in a range of voltages, speeds, mountings and enclosures.

For more details circle 214 on Enclosed Return Postal Card.

ELECTRIC BRAKE CLUTCH: The availability of a new line of products illustrated in a brochure has been announced by Warner Electric Brake and Clutch Co., P-78, Beloit, Wis. Entitled "Tailored Torque", the brochure explains the product's operating principle, describes several clutch, brake and clutch-brake applications and includes torque ratings and package dimensions.

For more details circle 215 on Enclosed Return Postal Card.

JUDGING ENGINE QUALITY: An 8 page handbook has been issued by the Engine Division, Caterpillar Tractor Company, Peoria, Illinois that emphasizes the features of various designs of engines which provide top performance for minimum cost, original and/or final. It discusses the factors involved with design, material and workmanship; reliability; cost of operation; parts and service availability and trade in or re-sale value.

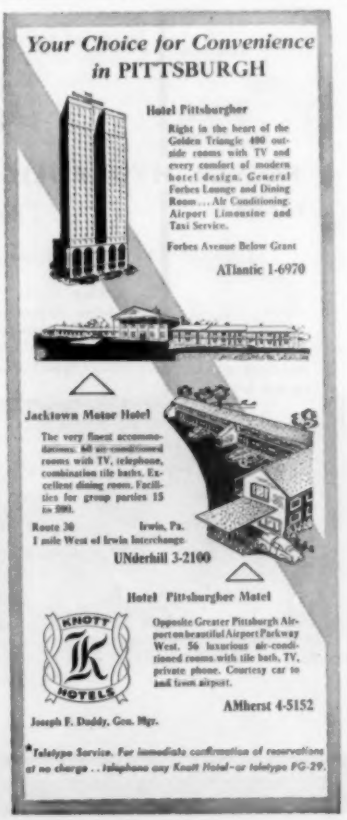
For more details circle 216 on Enclosed Return Postal Card.

With The Manufacturers

THEW SHOVEL: Chauncey B. Smythe, president of the Thew Shovel Co. and a long-time leader in the crane and shovel industry, was honored recently on the anniversary of his fiftieth year of service with the company. Mr. Smythe became president of the company in 1945.

UNION CARBIDE: A newly created office at the Union Carbide Corp. was immediately filled by Howard S. Bunn, who will be vice-chairman of the board. At the same time, the company announced the election of Birny Mason, Jr., as newly elected president.

MINNEAPOLIS-MOLINE: To dramatize the Moline "heel and toe" operation and the "comfort control zone" design of the new Motrac crawler, Minneapolis-Moline is touring the country with a caravan conducting clinics and demonstrations in cooperation with its dealer organization. Contractors and others interested in the line of machinery are being invited to attend the demonstrations to acquaint themselves with the actual working of the equipment.


Your Choice for Convenience in PITTSBURGH
Hotel Pittsburgher
Right in the heart of the Golden Triangle 400 outside rooms with TV and every comfort of modern hotel design. General Forbes Lounge and Dining Room.... Air Conditioning. Airport Limousine and Taxi Service.
Forbes Avenue Below Grant
ATlantic 1-6970
Jacktown Motor Hotel
The very finest accommodations. 60 air-conditioned rooms with TV, telephone, combination tile baths. Excellent dining room. Facilities for group parties 15 to 200.
Route 30 Irwin, Pa.
1 mile West of Irwin Interchange
UNderhill 3-2100
Hotel Pittsburgher Motel
KNOTT HOTELS
Opposite Greater Pittsburgh Airport on beautiful Airport Parkway West. 56 luxurious air-conditioned rooms with tile bath, TV, private phone. Courtesy car to and from airport.
AMherst 4-5152
Joseph F. Duddy, Gen. Mgr.
*Teletype Service. For immediate confirmation of reservations at no charge ... telephone any Knott Hotel—or teletype PG-29.

GALION PRODUCTS: The election of Alfred Dangler, Jr. as president of Hercules Galion Prod., Inc., of Galion, Ohio, was announced by a representative of that company. Dangler has been executive vice-president and general manager since 1952 and previously did work for a subsidiary of that corporation.

REO DIV. OF WHITE MOTOR CO.: Reo distributors and salesmen from throughout the U.S. and Canada gathered in Lansing recently to see the broadest line of new truck models ever produced by that company. One of the highlights of the meeting was the introduction of five new model series.

KOEHRING CO.: A mammoth construction equipment show, involving all of Koehring Company's various construction equipment manufacturing divisions will be held in 2, two-day flights the week of Sept. 19, at the Koehring proving grounds. More than 40 different machines in a variety of demonstrations under actual field conditions will be presented for an estimated 2000 contractors, and several hundred representatives and distributors.

The two flights are September 19 and 20, and September 22 and 23. The featured attraction will be a demonstration of the 34E Tribatch, a concrete paver with a three-compartment mixing drum.

U. S. STEEL CORPORATION's patented "T-1" constructional alloy steel has been issued its first license to be produced in a Los Angeles foundry. Under the agreement the foundry is authorized to produce "T-1" steel castings in a wide range of products for a score of industries it serves throughout 11 western states.

LEYLAND DIESEL TRUCKS, exhibited for the first time in the U. S. at the British Exhibition, received such acceptance in this country that a factory expansion program is now being launched in Britain for the manufacture of commercial vehicles to meet U. S. marketing requirements.

INTERNATIONAL HARVESTER Company's Construction Equipment Div. announced the election of Robert B. Bradley as vice-president and executive head of that company. Bradley joined the company in 1929 as a salesman. Presently, Bradley is president of I. H. of Canada, Ltd. He succeeds H. T. Reishus who has retired.

TIMKEN ROLLER BEARING Company's Eng. Div. announced two changes to strengthen the Division to meet recent needs. H. J. Urbach was given the title of director of engineering. R. E. McKelvey, has been promoted to assistant director of engineering.

GOODYEAR TIRE & RUBBER CO. announced the appointment of John F. Bennett as treasurer. Bennett filled a vacancy created by the recent death of Donald H. Walker, who was named treasurer only 11 days earlier. Mr. Walker suffered a heart attack in his office, May 14. Bennett has been with the company for 30 years.

IOWA MFG. CO., of Cedar Rapids, Iowa, appointed R. F. Plumb to the position of assistant sales manager, it was recently stated. Mr. Plumb has experience in aggregate and bituminous equipment and supervised the design of the Model "G" series Asphalt Plant.

DIAMOND T Motor Truck Co. has appointed P. R. Gordon as District Mgr. for the state of Michigan. Gordon joined the company in 1926 and recently served in the capacity of service parts manager. Previously, he has served the company as district sales manager for several midwestern states.

EIMCO CORP., recently elected a financial vice president and two other new vice presidents. T. F. Olson was appointed the office of finance vice president. Wayne Dowdey and Dr. D. Dahlstrom were also appointed to vice presidencies. Olson has recently joined the company. Dowdey and Dahlstrom have both been with the company for some time, serving in other capacities.

WHAT ABOUT YOU. MR. READER?

Are you still active in the field? Have you moved or changed your position?
Unless you send this information directly to use we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS DATE_____

22 WEST MAPLE STREET, CHICAGO 10, ILL.

☐ I do receive ROADS & STREETS and wish to continue to receive it

☐ I do not receive ROADS & STREETS but would like to have it

NAME

TITLE OR OCCUPATION

FIRM NAME OR GOVERNMENT DEPARTMENT (give street address)

CITY ZONE (if any) STATE

(If you have moved give *old and new* address)

SIGNATURE

Index to Advertisers

Acme Iron Works 194
Adams Machinery, Inc. 200
Allied Materials Corp. 35
Allis-Chalmers 99, 100, 101, 102, 103, 104, 105, 106
American Auto Parts Company, Inc. ..205
American Bitumuls & Asphalt Company 157
American Bridge Division—United States Steel Corporation ...47, 48 & 49
American Manganese Steel Division—American Brake Shoe Company 60 & 61
American Steel & Wire Division—United States Steel Corporation ....47, 48 & 49
Anderson & Co., Geo. G. 199
Armco Drainage & Metal Products ....166 & 167
Asphalt Equipment Sales Company ...203
Asphalt Institute, The ....62 & 63
Austin-Western 52, 53

Baron Steel Company 195
Bethlehem Steel Company ....3, 32 & 33
Boyer & Vinoverski, Inc. 199
Butler Bin Company 187

Casey & Dupuis Equipment Corp 201
Caterpillar Tractor Co. 51, 79, 80, 81, 82, 135, Third Cover
Cave Crushed Stone Co., William 195
Central Engineering & Contracting Corp. 204
Central New York Equipment Co., Inc. 201
Charles Machine Works, Inc. 44
Childers Manufacturing Co., Inc. 56
Claremont Machinery, Inc. 196, 202
Clark Equipment Company ....90 & 91
Cleveland Trencher Co., The 6
Cohen Iron Co., Leopold 204
Colorado Fuel & Iron Corporation, The 38
Columbia Geneva-Division United States Steel Corporation ....8 & 9, 47, 48 & 49, 112 & 113
Columbia Southern Chemical Corporation 172
Consolidated Western Steel Division—United States Steel Corporation ....47, 48 & 49
Constructors Equipment Corp. ...198, 203
Contractors Supply 202

Dakota Tractor & Equip. Co. 202
Dallas Brush Manufacturing Co. 200
Deere & Company ....21, 22, 23, 24, 25, 26, 27 & 28
Dietz, R. E. Company 39
Dotmar Industries, Inc. 185
Douglas, Inc., William H. 203
Dow Chemical Company, The 179
Drake Body & Equipment Co., Roy F. 201
Du Pont 45
Durabilt Const. Co. 198

Eighmy Equipment Company 203
Ellis Heated Asphalt Rollers 194
Eschenheimer Corp. 205
ESSO Standard, Division of Humble Oil & Refining Company 153
EUCLID Division of General Motors ....14 & 15
Everetts Inc. Shop 202

Firestone Tire & Rubber Co., The 46
Fishel Co., Al. 201
Fishel, Bill 204
Flexonics Corporation 189
Flintkote Company, The 185
Ford Motor Company, Industrial Engine Department 118
Forney's Inc. 206
Frantz Tractor Company, Inc. 196
Frysinger Construction Co. 200
Fuller Manufacturing Company, Transmission Division 43

Galion Iron Works & Mfg. Co. 70
General Motors Corporation 198
General Motors Corporation—Euclid Division ....14 & 15
General Motors Corporation—Truck & Coach Division ....123, 124, 125, & 126
Gilson Screen Co. 64
Goodyear, Truck Tire Dept. 5

Hawkins Equipment Co. 198
Hercules Steel Products Company 36
Hetherington & Berner, Inc. 155
Hogan, Chas. H. 201
Hotel Pittsburgher 208
Hotel Times Square 208
Hough Co., The Frank G. 65
Huber-Warco Company 57

International Drott, Construction Equipment 129
International Harvester Co. 204
International Harvester Company—Construction Equipment Division 54 & 55, 68 & 69, 138 & 139
International Salt Company 117
Iowa Manufacturing Company ....143, 144, 145 & 146

Jackson Vibrators, Inc. ....Second Cover
Jaeger Machine Co., The 181
James & Company, Inc., T. L. 199
Jay Tampers 181
Johns-Manville Corporation 171

Kemp Construction Co. 201
Kennedy's Van Brush Mfg. Co. 194
Kent Piling Co., Inc. 204
Kessen Construction Company 195
Kliebenstein Company, E. H. 204
Koehring Company—C. S. Johnson Company 11
Koehring Company Koehring Division 10
Kolman Manufacturing Co. 198

Laclede Steel Company 40
Lalonde Company, Albert 196
Leukart Machine Co., J—Jay Division 181
Lima Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation 41, 58
Link Belt Speeder Corporation ....30 & 31
Lubrecht, III, William 206

M-W Equipment Co. 202
Mack Truck Inc. 202
Maginniss Power Tool Co. 66
Marsh Excavating Co., Inc. 196
May Machinery Company, Inc. 195
McConnaughay Mixers, Inc. ..150 & 151
McGee Trucks, Inc. 203
Minnesota Branch Euclid Division of GM 199
Mississippi Valley Equipment Co. ...200
Monarch Road Machinery Co. 207
Mooney Tractor and Equipment Corporation 204
Morton Salt Company—Industrial Division 133
Mutual Truck Parts Co., Inc. 205

National Lead Company 59
National Tube Division—United States Steel Corporation ....47, 48 & 49
Northwest Engineering Company 37

Owen Bucket Co., The 141

P. H. R. Surplus Sales, Inc. 196
Park Tractor Co., George 200
Pelnik Wrecking Co., Inc. 199
Pettibone Mulliken Corporation 96
Pettibone-Wood Mfg. Co. 42
Portland Cement Association 95

Rhian, A. J. 205
Road Equipment Company 201
Rosco Manufacturing Co. 159
Ruemelin Mfg. Co. 44
Rupert Contracting Corp., William A. 201

Scranton Tractor & Equipment Co. ..195
Seaboard Equipment Co., Inc. 205
Shreveport Equipment Company, Inc. ..202
Simplicity System Co., The 161
Standard Equipment Co. 200
Standard Steel Corporation 7
Sweeney Bros. Tractor Co. 200
Swick-Guth Co. 207
Symons Clamp & Mfg. Co. 183

Tennessee Coal & Iron Division United States Steel Corporation 8 & 9, 47, 48 & 49, 112 & 113
Texaco Inc. Asphalt Sales ....Fourth Cover
Texaco Inc. Lubrication Division ....12 & 13
Timken Roller Bearing Company 18
Trinity Dam Contractors 197
Troyer Equipment Company, Stanley B. 204

United States Steel Corporation American Steel & Wire Division ....112 & 113
United States Steel Corporation Highway Division ....47, 48 & 49
United States Steel Corporation Structural Steel Division ....8 & 9
United States Steel Export—United States Steel Corporation ....8 & 9, 112 & 113
United States Steel Supply Division Steel Service Centers—United States Steel Corporation ....8 & 9, 47, 48 & 49
Universal Atlas Cement Division—United States Steel Corporation ....47, 48 & 49

Valley Steel Products Co. 199
Vandeventer Auto Sales 204
Villa Contracting Co., Inc. 205

Warren Manufacturing Co. 203
Waukesha Motor Company 34
Wenzel Machinery Co. 196, 202
West Sand and Gravel Co., Inc. 199
Western Services Corporation 204
Westport Machinery Co. 198, 203
Wheeling Corrugating Co. ....16 & 17
White Manufacturing Company 156
Williams Mfg. Co., Hugh B. 29
Wilson Machinery Supply Co. 196
Wiltgen Steel Building Sales 195

Yared & Company, Jacques J. 198
Yuba Consolidated Industries, Inc. 67

WORKING IN MUD...

DW21s push tough excavation job

Put yourself in the shoes of Grantwood Construction Co., Kirkwood, Missouri. The job—excavate 425,000 cu. yd. for the River Roads Shopping Center, St. Louis. Average haul distance—900-ft. round trip.

Here's the dark side of the picture. Bad weather turned the silt and clay into heavy, slippery muck. And the rains continued, throughout the spring.

Adverse conditions? Definitely! But the two DW21Gs took them in stride, moving big loads over soft ground.

Three features on the DW21G paid off big:

SYNCHROTOUCH TRANSMISSION CONTROL: It lets the operator shift simply by dialing the desired gear for automatic, split-second response. Result: faster shifting, faster cycles, more payloads per hour, less operator fatigue for higher daily production.

POWER: DW21G is rated at 345 HP (maximum output) . . . plenty of power to get heavy loads out of the cut . . . hustle them over soggy ground.

. . . for more details circle 289 on enclosed return postal card

GOOD FLOTATION: Wide-base tires on tractor and matching 470B Scraper carry big loads over ground that bogs down other rigs. 470B is rated at 19.5 cu. yd. struck . . . 27 cu. yd. heaped. Other features add up to lower maintenance cost; longer, more productive service. For example, strong bowl, draft frame and apron shrug off the punishment of heavy loads.

The DW21G delivers top performance on any job . . . especially the tough ones. Your Caterpillar Dealer has complete details on this versatile scraper combination. Ask him to demonstrate its profit potential on your job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—
THE HARD WORK

Laying second course of plant-mix Texaco Asphaltic Concrete pavement on highway through Ocala National Forest.

View of right of way cut through virgin forest for new highway. Limerock foundation at left is ready for Texaco Asphalt pavement.

Contractor: MARION CONSTRUCTION COMPANY, Ocala, Fla.

Builds Asphalt highway through virgin forest

The Florida State Road Department has constructed 13 miles of Asphalt-paved highway through the Ocala National Forest, in the state's northeastern corner. All but half a mile of this highway is located on new right of way, cut through virgin forest and swamp.

Plant-mixed Texaco Asphaltic Concrete, laid in two courses with a combined thickness of three inches, gives this highway a highly durable and resilient surface. Supporting it is an 8½ inch foundation of limerock. A Texaco Asphaltic Concrete pavement like this one withstands hard usage year after year with a minimum of maintenance. It is speedily laid and ready for traffic, because it requires no time consuming curing period. Motorists prefer the velvet smooth riding quality of its resilient, joint-free surface. Thanks to its skid-resistant texture and the sharp visibility of traffic lines on its dark surface, Texaco Asphaltic Concrete greatly reduces the danger of accidents.

Whether your highway or street project calls for heavy-duty, intermediate or low-cost paving, there is a type of Texaco Asphalt construction exactly suited to your requirements. If you would like assistance with a paving problem, our 55 years of Asphalt experience is at your service. Ask our nearest office to have one of our field representatives contact you.

Division Offices: TEXACO INC., Asphalt Sales Div., 135 E. 42nd Street, New York 17

Chestnut Hill 67, Mass. • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 1 • Minneapolis 3 • Philadelphia 2 • Richmond 25

TEXACO

TEXACO ASPHALT

Please send me your two brochures containing helpful information on heavy-duty, intermediate and low-cost types of asphalt construction for highways, streets, airports, etc.

Texaco Inc., Asphalt Sales, 135 E. 42nd Street, New York 17, N. Y.

Name ..... Position .....

Associated with .....

Address .....

. . . for more details circle 345 on enclosed return postal card